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Out-of-Line and Unadjusted Pupils in Monroe County

GROVER T. SOMERS, Professor of Education, Indiana University

THE wording of the subject of this report is such as to require an explanation of the meaning attached to certain of its terms. "Out-of-line" and "unadjusted" do not necessarily have the same connotation. It is conceivable that a child may be out-of-line with reference to a certain set standard and yet be reasonably well adjusted with respect to the essential behavior patterns involved in his life situations as a whole. It is likewise conceivable that he may be "in-line" with reference to this selfsame standard and yet be unadjusted with respect to his behavior patterns.

In Indiana, for example, 6½ years of age is the normal, typical, life age of the first grade child at the middle of the school year, 7½ years is the normal age of the second grade child at the middle of the school year, and so on throughout the elementary school. If we find some child who is somewhat above or below the typical age for that particular grade, we can very properly say that he is out-of-line with his age, but it is by no means certain that he is unadjusted to the activity requirements of that particular grade level.

It is likewise assumed that 6½ years is the typical mental age level of the first grade child, 7½ years is the typical mental age of the second grade child, and so on. If a child is found to possess a higher or lower mental age than is typical for the grade of which he is a member, he is considered out-of-line with his mental ability with respect to grade placement, but he is not necessarily unadjusted.

It is further assumed that the typical child of any grade achieves in the various subject activities up to a certain level, or norm, for his respective grade. If a particular pupil fails to achieve the normal amount or if he succeeds in achieving appreciably more than the normal amount, he is out-of-line with respect to educational achievement. He may or may not be greatly unadjusted.

However, if a pupil is somewhat younger or somewhat older chronologically than the average of pupils of his grade, if he is decidedly less capable or decidedly more capable mentally than the average of pupils of his grade, or if he is achieving far less or appreciably more than the average of his group, there is a suspicion of the lack of adjustment on his part. These facts are evidence of unadjustment but they do not constitute absolute and unmistakable proof of it. He may be somewhat out-of-line with respect to all three of these matters and yet he might be meeting the tasks with which he is from time to time confronted with reasonable success and with a moderate amount of satisfaction on his part. He may be reacting with a minimum of emo-

tional disequilibrium or of mental perturbation and with a maximum of individual complacency and social self-sufficiency.

What we are attempting to say is that there are factors and influences involved in unadjustment beyond the fold of what is connoted by the term out-of-lineness. There are certain inner and internal factors as well as outer and external factors. Some of these forces and influences are highly intangible and elusive—difficult to determine and well nigh impossible to identify. Some are beyond the scope of the present report and we shall make no serious attempt to discuss them. As our investigation is extended and when it matures we hope to be able not only to identify the cases in larger numbers but also to describe them at length.

Our present effort will be confined very largely to the identification of and report on pupils in Monroe County whose present grade locations are so far out-of-line with their life ages, mental ability levels, and educational achievement as to indicate definite need for further and more extensive study of the cases individually with a view to the application of corrective and remedial measures. If some of these cases are unadjusted, requiring treatment, the condition and need of each individual case must determine the sort of treatment—education or re-education—to be given. There are no universal educational panaceas for these unadjusted cases any more than there are medicinal cure-alls for the physical ills of humankind.

Testing Program

Our first procedure in determining and identifying these out-of-line cases—and possibly unadjusted ones—has been implied in connection with the foregoing definition of terms. The Monroe County Education Survey, conducted by Dr. F. R. Noffsinger under the direction of Dean H. L. Smith, made available data regarding the age, mental ability, and educational achievement of practically every pupil in the county outside of Bloomington. A fairly extensive testing program was carried out and reasonably reliable measurements on the pupils were obtained. The tests administered were:

1. Haggerty Reading Examination—for grades 1 to 3.
2. Stanford Achievement Test (Reading, Arithmetic, and Language Usage)—for grades 4 to 8.
3. National Intelligence Test—for grades 3 to 8.
4. Binet Test (Stanford Revision)—for "special cases" in School A and School H.

These tests were given by competent assistants under standard conditions, the papers were carefully scored, and the results were duly tabulated and analyzed with reference to the corresponding grade location of each pupil.

Age-grade tables were then constructed to ascertain the number of out-of-line cases and the amount of out-of-lineness with respect to all three aforementioned sets of measures—life age, mental ability, and subject-matter achievement. This was done for the county as a whole, for the several townships separately, and for each of the schools individually.

The forms we have constructed to represent our data depart somewhat from the strictly traditional age-grade tables. We believe that the child in his development through school and through life tends just normally and naturally to vary more widely from the mathematical average the longer he lives and the more extended his development becomes. His is roughly a straight line development and the attendant educational accumulation likewise may be represented by a straight line. If he is below the average at an early age he will be further below later; if he is above average early in life he will be further above later; and yet at neither of these later stages should the individual pupil be considered more of an "extreme case" simply because he is older and further removed from the average, provided his progress has been steady and regular.

What seems to be required is some scheme which will admit of increases in deviation from the arithmetic average with age or time as a natural and normal consequence of living and developing and acquiring. We have, therefore, adjusted our age-grade tables for out-of-lineness with these theoretical progressions of increase from the lower to the upper grade levels for those groups designated "moderately above" and "moderately below" normal. For our at-age or strictly normal group we have set one constant range of a year and a half as our limits throughout—from grades 1 to 8. We are following the traditional pattern in this particular in order to be able to make comparisons with other survey studies and survey data.

With respect to the moderately above and moderately below normal groups, we start with a range of two half-years in grade 1, and with fairly regular increments of increase this range is extended to five half-years in grade 8. Mathematically, we believe this increase should be regular, but this was not practicable with the measures at hand.

The other two groups—extremely above and extremely below normal—are composed of cases outside the aforementioned limits set for the moderately above and moderately below groups. In the first grade, for example, all cases more than three half-years from the norm (the middle half-year in the normal group) we consider extremely out-of-line, whereas in the eighth grade only those who are more than six half-years from the norm are considered extremely out-of-line. These two "extreme" groups constitute the majority of the cases that are of primary interest to us in our present study.

When our data on life age, mental ability, and educational achievement were tabulated and distributed according to the limits set, it was clearly apparent that they fitted into this scheme, as shown in Tables I, II, and III, and that an appreciably wider range of scores in half-year units existed in the case of the upper grades than in the case of the lower grades. The question arises as to whether the school organization and administration or the traditional treatment of such data was responsible for this marked increase in "spread-out-ness." That is to say, does the school so strait-jacket the child as to force him into a certain narrow groove of activity, if he is not to be considered out-of-line, or are we failing somewhat in the interpretation of our data?

TABLE I. CHRONOLOGICAL AGE-GRADE DISTRIBUTION FOR BOYS AND GIRLS IN MONROE COUNTY ELEMENTARY SCHOOLS

Age	First Grade	Second Grade	Third Grade	Fourth Grade	Fifth Grade	Sixth Grade	Seventh Grade	Eighth Grade	Total
5	7								7
5½	23	2							25
6	100	13							113
6½	160	23	6						189
7	126	95	15						236
7½	67	143	23	4					237
8	38	98	76	14	1				227
8½	16	73	112	25	4				230
9	7	36	88	64	18	2			215
9½	8	35	66	107	27	5			248
10	2	12	41	90	73	13	1	1	233
10½	2	16	39	66	82	42	4		251
11	2	5	8	49	66	72	15	4	221
11½	3	5	7	23	71	84	20	10	223
12	1		12	11	40	59	72	21	216
12½		1	8	16	25	72	77	20	219
13	1	2	1	6	21	44	62	59	196
13½		1	3	6	15	35	64	79	203
14			2	3	10	23	34	64	136
14½				2	1	11	26	51	91
15			1	3	3	5	20	44	76
15½					3	1	11	26	41
16							1	9	10
16½					2		1		3
17					1	1		1	3
17½								1	1
18 or over								1	1
TOTAL	563	560	508	489	463	469	408	391	3,851

TABLE II. MENTAL AGE-GRADE DISTRIBUTION FOR THE CHILDREN IN GRADES 3-8, IN MONROE COUNTY

TABLE II. MENTAL AGE-GRADE DISTRIBUTION FOR THE CHILDREN IN GRADES 3-8, IN MONROE COUNTY

Age	Third Grade	Fourth Grade	Fifth Grade	Sixth Grade	Seventh Grade	Eighth Grade	Total
Under 5	1						1
5½	1						1
6	2						2
6½	8	1					9
7	21	1		1			23
7½	70	14	5	5			94
8	32	20	3	1			56
8½	73	46	11	6	3		139
9	53	48	20	6	1	3	131
9½	43	56	36	13	5	1	154
10	30	61	38	28	7	1	165
10½	31	65	66	47	12	8	229
11	18	61	55	55	24	10	223
11½	7	40	65	74	39	25	250
12	4	12	49	61	63	32	221
12½		3	36	46	42	30	157
13		3	22	42	49	39	155
13½		3	11	16	32	33	95
14		2	8	20	32	46	108
14½			3	8	28	31	70
15				4	22	32	58
15½			1		11	21	33
16					6	19	25
16½					2	14	16
17						4	4
17½				1		2	3
18 or over						1	1
TOTAL	394	436	429	434	378	352	2,423

TABLE III. EDUCATIONAL AGE-GRADE DISTRIBUTION OF PUPILS IN MONROE COUNTY

Age	First Grade	Second Grade	Third Grade	Fourth Grade	Fifth Grade	Sixth Grade	Seventh Grade	Eighth Grade	Total
5	174	37	4	1					216
5½	133	57	7						197
6	36	30	4						70
6½	31	22	6						59
7	33	74	27	2					136
7½	16	66	31	1					114
8	13	50	35	3					101
8½	6	74	86	15	3	2		1	187
9		26	44	51	12	4	2		139
9½	3	29	73	74	23	7	2		211
10		16	57	101	41	16	4	3	238
10½	2	6	39	109	107	68	18	3	352
11		1	8	51	106	81	24	12	283
11½			1	25	69	78	60	30	263
12				7	29	63	55	28	182
12½				3	24	53	56	42	178
13					10	29	40	40	119
13½					2	16	27	35	80
14					2	10	26	25	63
14½					1	3	23	39	66
15						6	20	32	58
15½						3	21	32	56
16							7	26	33
16½								9	9
17								3	3
17½								1	1
18								1	1
TOTAL	447	488	422	443	429	439	385	362	3,415

Our data were distributed according to our scheme of increased increments with grade levels, and our extreme groups combined constituted roughly 7 per cent of the school population, with approximately 40 per cent of the two combined moderately above and moderately below groups, which seemed to be a pretty good justification for the limits set. Especially is this true in the light of what we have come to accept as reasonable proportions for exceptional or extreme cases. The frequency of cases may be seen in Tables I, II, and III for the entire county for each of these five groups for each grade level from 1 to 8, in half-year units, on the basis of chronological age, mental age, and educational age, respectively.

A total of 636 cases were reported as being extremely out-of-line and possibly unadjusted. Of these 636 cases, 266 were found to be extremely overage chronologically and very few (only 3 in all) were extremely underage; approximately 100 (103 to be exact) were extremely overage mentally and about one-third of this number (33 in all) were extremely underage; and 111 were extremely overage educationally, whereas 120 were extremely underage. In general there seems to be a marked amount of accumulated overageness throughout. It would seem that our schools are somewhat lacking in flexibility with respect to the abilities and needs of the more capable pupils and those who are achieving relatively much. We seem to be adapting much better to the less capable and less acquiring groups!

Teachers' Opinions

The second procedure we used in locating and identifying these out-of-line, and possibly unadjusted, cases was that of sending to the teachers a fourfold blank, designated "Unadjusted-Pupil Blank." The teachers were asked to list the names of pupils who fell in the following groups of problem pupils:

1. Those who are in a higher grade than they should be for their age by at least one year.
2. Those who are in a lower grade than they should be for their age by at least one year.
3. Those who are disciplinary problem cases.
4. Those who are retarded on account of physical defects, illness of pupil or family, poverty, lack of parental coöperation, and the like.

In connection with each case reported the teacher was asked to indicate the nature of the problem and the chief cause or causes of the condition.

Of the 1,720 cases reported by the teachers, 452 were discovered by both the testing program and the teachers' opinions, 244 were discovered by the testing program but not recognized as problem cases by the teachers, and 1,024 were designated by the teachers but proved to be normal or near-normal (that is, not extremely out-of-line) by the testing program.

The number of cases in each of these four groups, given by grades for the entire county together with the teachers' reasons, is reported in Tables IV, V, VI, and VII. A total of 1,476 pupils were identified by the teachers, but many teachers failed to supply information on the nature and cause in each case.

TABLE IV. REASONS GIVEN BY TEACHERS FOR PUPILS BEING IN A HIGHER GRADE THAN THEY SHOULD BE FOR THEIR AGE BY AT LEAST ONE YEAR

Reasons	Grades								Total
	1	2	3	4	5	6	7	8	
A. Students Satisfactorily Advanced—									
Good student	..	2	6	1	3	6	4	2	24
Started early	2	3	1	6	1	3	2	4	22
Double promotion	..	1	..	2	..	4	5	2	14
Exceptional ability	1	..	1	3	..	1	6	2	14
Attended summer school	..	..	..	..	..	..	..	1	1
Inherited	..	..	..	..	1	..	..	..	1
Sub-Total	3	6	8	12	5	14	17	11	76
B. Students Unsatisfactorily Advanced—									
Promoted too fast	..	..	1	2	..	2	..	2	7
Started too soon	2	1	..	..	..	1	..	..	4
Slow thinker	..	2	..	..	1	..	..	..	3
Has difficulty	..	..	2	..	..	1	..	..	3
Too young mentally	1	..	..	..	..	..	1	..	2
Loses too much sleep	..	..	..	..	..	..	1	..	1
Restless—not uniform	..	..	..	..	1	..	..	..	1
Should not be in group	..	..	..	1	..	..	..	..	1
Plays	..	1	..	..	..	..	..	..	1
Sub-Total	3	4	3	3	2	4	2	2	23
C. Students Advanced—Whether Adjusted or Unadjusted Unknown—Judgment of Teachers Inadequate or Lacking—									
Problem not indicated	1	2	12	10	10	14	13	40	102
Teacher does not know reason	..	2	..	..	..	2	..	1	5
Reason given inadequate	..	2	..	..	..	1	..	1	4
Transient	..	1	..	..	..	..	..	..	1
Sub-Total	1	7	12	10	10	17	13	42	112
Grand Total	7	17	23	25	17	35	32	55	211

TABLE V. REASONS GIVEN BY TEACHERS FOR PUPILS BEING IN A LOWER GRADE THAN THEY SHOULD BE FOR THEIR AGE BY AT LEAST ONE YEAR

Reason	Grades								Total
	1	2	3	4	5	6	7	8	
Reason not given	14	13	14	17	16	14	7	15	110
Mentally deficient	13	15	13	20	10	7	13	10	101
Slow	7	14	10	7	17	19	14	10	98
Failure	8	9	14	7	13	12	13	8	84
Entered late	13	12	9	4	13	12	8	5	76
Illness	5	5	3	7	6	5	14	14	59
Absent from school	5	4	12	10	8	6	4	3	52
Transients	2	3	6	8	6	6	7	9	47
Physical defects	6	8	6	4	3	8	1	3	39
Poverty	9	4	2	2	1	5	3	3	29
Environment	4	3	4	7	1	7	..	1	27
Inattentive	8	2	2	5	2	3	1	2	25
Uninterested	1	2	1	3	5	7	2	4	25
Poor health	5	3	1	3	3	2	..	..	17
Improper home conditions	..	3	1	..	3	5	1	3	16
Lack of coöperation	..	4	2	..	1	3	1	1	12
Backwardness	3	3	3	1	..	..	..	1	11
Slow start	2	5	..	1	1	..	1	..	10
Cannot read	..	2	1	1	2	3	..	..	9
Lack of books	..	1	..	2	2	1	..	..	6
Heredity	1	2	..	..	..	1	1	..	5
Reason pointless	1	..	..	..	1	1	..	2	5
Tobacco	..	..	2	2	..	..	1	..	5
Wrong attitude	..	..	..	1	..	..	1	1	3
Work too difficult	..	..	1	..	..	..	..	2	3
Lazy	..	..	..	..	1	..	1	1	3
No good	2	..	..	..	..	..	..	..	2
Poor instruction	..	..	1	1	..	..	..	..	2
Does not work	..	..	..	..	..	1	1	..	2
Home training stubborn	..	..	..	..	..	..	2	..	2
Careless	..	..	..	..	..	1	..	1	2
Entered early, lost interest	1	..	1	..	..	..	..	..	2
Absent on permit	..	..	..	1	..	..	..	..	1
Truant—lazy—parents non-coöperative	..	..	..	..	..	1	..	..	1
Would not recite	1	..	..	..	..	..	..	..	1
Undernourished	1	..	..	..	..	..	..	..	1
Total	112	117	109	114	115	130	97	99	893

TABLE VI. REASONS GIVEN BY TEACHERS FOR PUPILS BEING DISCIPLINARY CASES

Reasons	Grades								Total
	1	2	3	4	5	6	7	8	
Inattentive—mischievous	3	4	9	5	3	7	2	2	35
Inattentive	7	7	4	5	4	1	1	1	30
Nervous	7	5	6	2	4	2	1	1	28
Mischievous	3	4	3	5	5	2	1	3	26
Truancy	..	3	2	5	2	2	5	..	19
Backward	5	..	2	..	1	2	1	3	14
Temper	1	2	2	1	..	3	2	1	12
Mentally deficient	2	3	..	2	1	2	1	..	11
Inattentive—backward	2	1	4	1	..	..	..	..	8
Nervous—mischievous	..	..	1	..	2	2	2	..	7
Inattentive—truancy	1	..	1	2	2	1	..	..	7
Nervous—temper	1	1	2	1	1	..	1	..	7
Temper—mischievous	..	..	2	..	2	1	1	..	6
Nervous—inattentive	3	1	1	1	..	..	..	..	6
Nervous—backward	3	..	1	..	2	..	..	..	6
Defiant—mischievous—inattentive	1	3	..	1	..	..	..	..	5
Lazy	..	..	1	..	..	3	..	..	4
Inattentive—temper	..	..	1	2	..	1	..	..	4
Mischievous—truancy	..	1	..	..	1	1	1	..	4
Poor home training	..	..	1	2	..	..	..	..	3
Quarrelsome	1	..	..	..	..	1	..	1	3
Won't work	3	..	..	..	..	..	..	..	3
Stubborn	1	..	..	..	..	..	1	..	2
Backward—temper	1	..	..	..	..	..	..	..	1
Vulgar	..	..	..	..	..	..	1	..	1
Inattentive—temper—truancy	..	..	..	1	..	..	..	..	1
Mischievous—lazy	..	1	..	..	..	..	..	..	1
Mischievous—timid	..	..	1	..	..	..	..	..	1
No books	..	..	..	1	..	..	..	..	1
Discourteous	..	..	..	..	..	1	..	..	1
No reason given	..	1	..	..	..	..	..	..	1
Total	45	37	44	37	30	32	21	12	258

TABLE VII. MISCELLANEOUS REASONS GIVEN BY TEACHERS FOR PUPILS BEING RETARDED

Reasons	Grades								Total
	1	2	3	4	5	6	7	8	
Illness	3	7	8	1	2	5	6	4	36
Poverty	3	7	8	5	2	3	4	1	33
Entered late	6	10	4	2	..	2	2	2	28
Mentally deficient	6	5	3	4	3	4	2	1	28
Parents non-coöperative	1	7	3	4	3	4	2	1	25
Physical defects	2	1	1	1	1	1	1	4	12
Poor health	1	1	2	4	3	1	..	..	12
Non-coöperation	..	..	..	2	2	2	1	2	9
Truancy, parents non-coöperative	..	..	2	3	1	..	2	..	8
Environment	..	2	..	2	..	2	2	..	8
Homework	..	..	2	2	3	..	..	..	7
Defective speech	1	1	1	..	2	1	..	1	7
Heredity—poverty	..	..	2	3	..	..	..	1	6
Lack of school books	1	..	1	1	1	1	..	..	5
Defective hearing	2	1	..	..	..	2	..	..	5
Lazy	..	1	1	1	..	1	..	..	4
Poverty—low mentally	3	..	..	..	1	..	..	..	4
Defective eyes	..	1	1	..	..	..	1	..	3
Homework—entered late—no books	..	..	1	..	1	..	1	..	3
Nervous	1	..	..	..	..	2	..	..	3
Slow	..	..	..	1	..	2	..	..	3
Advanced for mentality	..	..	1	..	..	1	..	..	2
Lack of clothing	..	..	..	1	..	1	..	..	2
Physical defects	..	..	..	1	..	..	..	1	2
Illness—broken home	..	..	1	..	..	..	..	..	1
Cannot read	..	..	..	..	1	..	..	..	1
Far from school	1	..	..	..	..	..	..	..	1
Transient	..	..	1	..	..	..	..	..	1
Malnutrition	..	..	..	..	..	..	..	1	1
Poor start	..	..	..	..	..	1	..	..	1
Lack of interest	..	..	..	..	..	1	..	..	1
Backward—temper	1	..	..	..	..	..	..	..	1
Moron	..	..	1	..	..	..	..	..	1
Total	32	44	44	38	26	37	24	19	264

There are 211 cases in Table IV and 110 cases in Table V for whom the teachers have failed to supply the probable cause for acceleration and retardation. This failure to designate the cause may be due to the fact that the teachers did not have time to investigate or did not know how to discover the essential facts, or it may be that these facts were not readily available. Perhaps the instructions on the blank were not altogether unambiguous to some teachers. It is fairly clear, however, that, for the disciplinary and miscellaneous types of cases (Tables VI and VII), teachers could and did supply reasons in practically every instance. Probably with a little more alertness and drive it would not be impossible to discover at least one cause, if not always the correct one, to account for the condition of each and every problem pupil.

Comparison of Testing Program and Teachers' Opinions

Our third and final procedure in locating and identifying these out-of-line, or unadjusted, cases was that of comparing the results of the two techniques already described.

A total of 1,476 problem cases in the county were listed by the teachers. Of this number only 452 were revealed as out-of-line by the testing program. On the other hand, the testing program identified 696 cases as extremely out-of-line, only 452 of whom were included in the teachers' lists.

In the accelerated group there were 182 cases in all. Of these, 153 were found to be in the normal group according to test results. Thus only 29, or about 16 per cent, of the cases were located as being out-of-line by both teachers and tests.

In the retarded group there were 821 cases, according to the teachers' opinions, 244 (or about 30 per cent) of whom were also identified by tests as being out-of-line.

The teachers' lists placed 239 cases in the disciplinary group. Ninety-three, or 29 per cent, of these were found to be out-of-line according to the test results.

There were 234 cases placed by the teachers in the general or miscellaneous group, but only 86, or 27 per cent, of these were located by the tests as being definitely out-of-line.

These cases were further analyzed to determine the combinations of age levels and the numbers of each combination in each grade. Table VIII shows the combinations of age levels as found by the testing program, together with the grade location of each individual pupil.

According to this table there were 9 pupils who were below normal educationally and yet they were normal mentally and chronologically; there were 30 pupils who were normal chronologically and educationally but were below normal mentally; and there were 8 pupils who were normal chronologically and mentally who were above normal educationally. These three groups of pupils do not require the same sort of treatment to enable them to be brought into line or to enable them to become better adjusted to their school work. The 9 pupils who are at age chronologically and mentally but below normal educationally need greater stimulation. They are not working up to their ability

TABLE VIII. DISTRIBUTION AND ANALYSIS OF THE CHRONOLOGICAL, EDUCATIONAL, AND MENTAL AGE STATUS AS DETERMINED BY THE TESTING PROGRAM OF THE 1,476 CASES LISTED AS OUT-OF-LINE BY THE TEACHERS

Combinations			Grades								Total
CA	EA	MA	1	2	3	4	5	6	7	8	
Normal	Normal	Normal	78	99	124	123	127	175	154	144	1,024
Above	Above	Normal	...	...	...	1	1	...	...	...	2
Above	Above	None	1	5	1	...	...	...	...	...	7
Above	Normal	Above	...	...	...	...	1	...	...	...	1
Above	Normal	Normal	2	4	13	32	9	9	1	2	72
Above	Normal	Below	1	4	1	2	1	3	...	...	12
Above	Normal	None	11	21	26	14	6	5	...	1	84
Above	Below	None	7	23	2	3	1	...	...	...	36
Above	None	Normal	...	...	...	1	...	...	...	...	1
Above	None	None	21	11	6	14	12	1	1	1	67
Normal	Above	Above	...	...	...	1	...	...	...	1	2
Normal	Above	Normal	...	1	...	...	1	3	3	...	8
Normal	Above	None	2	9	1	...	...	1	1	1	15
Normal	Normal	Above	...	...	...	1	8	2	2	2	15
Normal	Normal	Below	...	...	8	2	6	9	4	1	30
Normal	Below	Normal	2	4	2	...	...	...	...	1	9
Normal	Below	Below	...	...	2	...	...	3	1	...	6
Normal	Below	None	29	28	12	...	1	...	...	...	70
Below	Normal	Normal	...	...	1	...	...	...	...	...	1
Below	Normal	None	...	...	1	...	...	...	...	...	1
Below	Below	None	4	6	1	2	...	...	...	...	13
Total			158	215	201	196	174	211	167	154	1,476

and should be more strongly motivated. On the other hand, the 8 pupils who are at-age chronologically and mentally and yet are doing superior work are doing all that can reasonably be expected of them and they should be praised and kept encouraged. The 30 who are below average mentally but are achieving an average amount also need praise and commendation if they are to be kept moving forward at a reasonably rapid pace.

Although these cases are grouped in Table VIII, each pupil is an individual problem, with his own particular characteristics and needs. A few are extremely out-of-line in comparison with the average of the group of which they are members; and in many cases they are definitely unadjusted, or even maladjusted. The needs of such children should be studied carefully so that such remedial measures as seem advisable may be administered.

Conclusions

One of the important facts revealed by our study thus far is the need of pupil study by the teacher. We should know what each pupil

is achieving in comparison with other children of his age, ability, and opportunity so as to be able properly to evaluate his work. We must know not only his ability as reflected in his achievement, and perhaps by formal testing and the home and street conditions under which he struggles, but also his problems, his difficulties, and his conflicts. It is from these latter affairs oftentimes that the secret of his failure to adjust will be discovered.

The present investigation of these extremely out-of-line pupils and those whom we may very properly term unadjusted has not yet progressed far enough for us to say exactly what treatment should be applied. We need to know the particular needs of each child in order to have a basis for immediate teaching or re-teaching endeavors. Only general tests were administered in the survey. For the extreme cases, at least, there is a real need for diagnostic tests. Facts from such tests are sometimes of far greater value to the teacher than are facts from general tests, as they may reveal a very special need at some particular point.

There is, moreover, a vital need for detailed information concerning the life history—educationally and otherwise—of these extremely out-of-line pupils. The information necessary to an understanding of the problems and struggles of each is frequently not available in his school record. We can plan the educational program for each particular case only when we possess an understanding of what is awry and have the determination to see that proper remedies are applied. In the final analysis, each pupil must be dealt with as an individual—a problem within himself—to be treated according to his own special needs.

Suggestions and Recommendations

On the basis of the facts discovered in connection with our study, we would offer the following suggestions and recommendations:

1. That our thinking of pupils *en masse* and our traditional treatment of them as a herd of "dumb driven cattle" be discontinued. That greater and more extensive study be made of each pupil as an individual with particular abilities and disabilities, likes and dislikes, interests and antipathies, urges and inhibitions, and other inchoate characteristics, many and diverse.
2. That one means of discovering important facts and valuable information is an impersonal general and diagnostic testing program. We can find the pupil's location in ability and achievement in comparison with the different age and grade groups. Is he accomplishing more or less than we may reasonably expect of him? In what particulars is he "short" or "long"? And what are the indicated needs in his particular case?
3. That teachers should be encouraged to study each and every pupil as an individual, to learn what his nature and needs really are, in order to be able more fully to cope with them. If and when this is done the teacher's opinion will be a very valuable and reliable means of identifying these cases in connection with a school survey or investigation of out-of-line or unadjusted pupils.

4. That a further means of discovering vital information toward an enlightened program of education and re-education is a somewhat detailed case study of each pupil who has been discovered by the testing program to be decidedly out-of-line or who has been identified by the teacher as a problem case. We believe that nothing just happens—not even some inattentive behavior expression on the part of a pupil—whatever takes place is *caused!* The cause may not be clearly apparent in the act itself, but if we know the larger *life history* of the child—his medical, physical, social (home and community), educational, and emotional history—we would be able to understand his case reasonably well and be able more nearly to advise or administer the proper treatment. Unless and until we possess this information we shall not be prepared to plan a rational program for conditioning and reconditioning the individual.
5. That all these sources of information be utilized by the teachers and parents and school officials with a view to planning a program for those pupils who are especially in need of help in making a reasonable adjustment to school requirements and to the larger social situations in life. This in our judgment is the crucial element in the whole problem—the soundness of the remedial measures applied to those in need of special help. If a pupil proves to be poor in reading or arithmetic or language or if he is found by our tests and scales to be weak in some special parts or phases of these subject-activities, the exercises planned and applied must be of a certain character to remedy the condition. If his difficulty is a physical or emotional or mental matter the remedial measures must be quite different in character. Just what shall be the character of the remedies prescribed only the nature of the difficulty itself in any particular case may determine. We propose that the teachers discover the facts and plan the remedies to fit them.
6. That a special room or a special school be provided for the education or re-education of a goodly number of these out-of-line pupils. We believe that many of these "cases" may be saved to society educationally by providing them with a special type of training suited to their abilities and needs. Such training is at the present time offered in some of our "special schools" and in the genuine junior high school. We should consider the possibility of the county and city operating jointly the special school already established in Bloomington. We should also consider the possibility of establishing and operating coöperatively a series of junior high schools which will serve the needs of both county and city, for, after all, that which is beneficial to one locality or social unit is, to a very great extent, beneficial to the neighboring local unit or social group. We need but recognize the fact that the population of any community today is a moving population. Our flocks do not forever continue to graze in the same home pastures!

The Monroe County School Survey

CLARENCE LEUCK, Monroe County Superintendent of Schools, Bloomington

Story of the Survey

THE Monroe County School Survey was carried on by labor provided by the local Civil Works Administration. Approximately 2,000 hours of labor were provided under this program. Indiana University Federal Emergency Relief funds provided 1,200 hours of labor for tabulating and other phases of the work. Tests and supplies, at a cost of approximately $500, were provided by the Bureau of Coöperative Research of the School of Education by Dean Henry Lester Smith. Over 2,000 Stanford Achievement Tests were given grades 4 to 8; almost 2,500 National Intelligence Tests were given grades 3 to 8; and approximately 1,400 Haggerty Reading Tests were given grades 1 to 3. Questionnaires were filled out by over 2,000 children and by each teacher in the county. Visitation of the 62 schools of the county required some 700 miles of transportation donated by the county attendance officer, county superintendent, and members of the faculty of the School of Education. Due credit must be given to the teachers and pupils for their honest efforts in assisting in this survey.

Scope of the Survey

The size of the educational problem in the county.—The educational problem in Monroe County was one which involved the pupils enrolled in the 12 townships, exclusive of the city of Bloomington.

It can be observed from Table I that the county enrollment is considerably distributed.

TABLE I. ENROLLMENT OF PUPILS IN MONROE COUNTY SCHOOLS AS SHOWN BY TYPE OF SCHOOL CLASSIFICATION*

Type of School	Number of Schools	Number of Pupils Enrolled
One-room elementary school	42	1,187
Two-room elementary school	6	382
Three-room elementary school	2	210
Four-room elementary school	8	1,179
Elementary schools of more than four rooms	4	1,024
High school	4	484
Total	66	4,466

* The elementary schools with more than four rooms are consolidated with the four high schools, giving a total of 62 distinct schools.

In a similar manner Table II shows enrollments in the county schools by grades.

TABLE II. MONROE COUNTY SCHOOL ENROLLMENTS BY GRADES

Grade	Enrollment	Grade	Enrollment
1	613	7	418
2	585	8	375
3	499	9	178
4	514	10	116
5	489	11	102
6	489	12	88
		Total	4,466

The extent of the survey program.—The program was so arranged that the following phases of the work were collected and studied:

(1) The testing program, consisting of:
   a. Haggerty Reading Tests, grades 1 to 8
   b. Stanford Achievement Tests (Reading, Arithmetic, Language Usage), grades 4 to 8
   c. National Intelligence Tests, grades 4 to 8
(2) Teacher's daily program
(3) Teacher's status
(4) Social study of pupils
(5) School buildings
(6) Transportation
(7) Finances
(8) Land values
(9) Grade-progress of pupils

In general all phases of the survey have yielded a wealth of information from which plans for procedure are being made. In this brief report it is possible to give only a few of the findings and results that are being obtained.

Outstanding Findings from the Survey

Deficiency in reading.—Table III shows the percentages of pupils who are above normal, normal, and below normal in grades 1 to 8. A normal age of 1½ years was allowed for each grade, which took into consideration the variation of the enrolling ages of pupils beginning with the first grade. Significant results are indicated by the high percentage, 68.9, of pupils below normal age in the first year of school. This percentage was greatly reduced by the third year, being only 18.6, which was considered to be fairly normal. The below-normal percentages increased rapidly from 36.7 in the fourth grade to 67.6 in the sixth grade, after which there was a slight falling off again in grades 7 and 8. Normal and above-normal percentages were seriously affected by high, below-normal percentages.

TABLE III. PERCENTAGE OF PUPILS IN EACH GRADE ABOVE NORMAL, NORMAL, AND BELOW NORMAL IN READING

Classification	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
	Normal Age 6–7½	Normal Age 7–8½	Normal Age 8–9½	Normal Age 9–10½	Normal Age 10–11½	Normal Age 11–12½	Normal Age 12–13½	Normal Age 13–14½
Above normal age	8.1	31.9	41.1	10.2	9.9	8.8	16.8	12.1
Normal age	23.0	39.4	40.3	53.1	36.4	23.6	16.0	24.7
Below normal age	68.9	28.7	18.6	36.7	53.7	67.6	67.2	63.2

There is a noted trend in this classification toward an increase in above-normal percentages until the fourth grade, when there is a marked falling off of the above-normal reading age group and a rapid increase in the percentage of the below-normal reading age group. Since the below-normal age group begins to increase after the third year, this seems the logical place to begin remedial work in reading.

Age grade study.—As shown by Table IV, Monroe County pupils are considerably overage chronologically, since overage percentages are much greater than underage percentages. The overage percentages increase until the fifth grade, after which there is a reduction in these groups as pupils reach the ages at which they withdraw from school.

TABLE IV. PERCENTAGE OF CHRONOLOGICAL OVERAGENESS, NORMAL-AGENESS, AND UNDERAGENESS OF MONROE COUNTY PUPILS BY GRADES

Degree of Ageness	Grades								Total
	1	2	3	4	5	6	7	8	
Overage	26.1	33.2	37.0	37.8	41.5	40.9	38.5	34.0	35.8
Normal	68.6	60.0	54.3	53.4	47.7	45.9	51.7	51.3	54.7
Underage	5.3	6.8	8.7	8.8	10.8	12.2	9.8	14.3	9.5

Table V shows a comparison of the percentages of chronological overageness, normal-ageness, and underageness in Monroe County with standard percentages, with grades 1, 5, and 7 used for comparison. The overage condition stands out clearly in all three grades, with the extreme percentage being shown in grade 1. First grade pupils who are overage are in many cases pupils who are repeating the grade, many of whom are pupils of inferior ability.

TABLE V. COMPARISON OF THE PERCENTAGE OF CHRONOLOGICAL OVERAGENESS, NORMAL-AGENESS, AND UNDERAGENESS IN MONROE COUNTY, WITH STANDARD PERCENTAGES

Grade	Overage	At Age	Underage
1. Monroe County	26.1	68.6	5.3
Standard	9.8	72.9	17.3
5. Monroe County	41.5	47.7	10.8
Standard	21.6	62.5	15.9
7. Monroe County	38.5	51.7	9.8
Standard	22.5	58.9	18.6

In Table VI are shown the percentages of educational overageness, normal-ageness, and underageness of pupils in Monroe County. A high percentage of overageness and a low percentage of underageness stand out distinctly in the fourth grade.

TABLE VI. PERCENTAGE OF EDUCATIONAL OVERAGENESS, NORMAL-AGENESS, AND UNDERAGENESS OF MONROE COUNTY PUPILS BY GRADES

Degree of Ageness	Grades								Total
	1	2	3	4	5	6	7	8	
Overage	9.0	31.1	42.1	44.0	31.9	27.3	32.2	39.5	31.8
Normal age	22.4	38.9	39.1	51.0	59.2	50.6	39.2	27.6	41.2
Underage	68.6	30.0	18.8	5.0	8.9	22.1	28.6	32.9	27.0

Table VII shows the percentage of mental overageness, normal-ageness, and underageness of pupils in Monroe County in grades 3 to 8. Here, again, we find the overage tendency prevalent with the underage percentage high in all grades, but with the normal-age percentage noticeably low.

TABLE VII. PERCENTAGE OF MENTAL OVERAGENESS, NORMAL-AGENESS, AND UNDERAGENESS OF MONROE COUNTY PUPILS IN GRADES 3-8

Degree of Ageness	Grades						Total
	3	4	5	6	7	8	
Overage	33.8	43.8	54.4	31.6	35.2	35.2	37.5
Normal age	40.1	37.8	37.1	43.8	40.7	33.5	39.0
Underage	26.1	18.8	17.5	24.6	24.1	31.3	23.5

A general comparison of chronological, educational, and mental ageness justifies a re-classification of pupils on a systematic basis, when all evidence is considered.

Teachers.—The efficiency of instruction in any school system depends, among other factors, upon the quality of teaching ability in that school system. Instruction includes the contacts the teacher makes with the pupils in the schoolroom in the regular work of the school day. It also includes those intangible results of out-of-school contacts which the teacher makes with the pupils, members of the community, school officials, other members of the profession, and with life in general.

A total of 133 teachers returned questionnaires, of whom 40 were men and 92 were women. Of this group 82 were 30 years of age or under; 24 were over 40 years of age, 3 were 60 years old; and 10 were 50 years old. The age groups were evenly distributed throughout the entire county. Little criticism can be directed to teachers' ages when 62 per cent of the teachers are under 31 years of age and 92 per cent are under 51 years of age. There seems to be a slight tendency for one-teacher schools to be taught by teachers in the upper age group. There is no evidence that extremely young teachers are employed in too great a proportion in any one type of school, the proportion for each type of school being about the same as for the county as a whole.

Since the area surveyed is largely rural in character, teachers with a rural background would seem to have greater possibility for effective service in Monroe County schools. No less than 80 of the 133 teachers of the county gave farming as their father's occupation. Half of the teachers gave Monroe County as their place of birth. Of the remaining, 57 were born in Indiana outside Monroe County, and only 5 were born outside the state.

The amount, quality, and recency of training of teachers is likely to affect the efficiency of teaching. Only 26 of the 133 teachers have received the bachelor's degree from a higher institution of learning. Of this number only 4 have received a master's degree, although 20 have taken some graduate work. In most cases college training has been received at Indiana University, Central Normal College at Danville, and Indiana State Teachers College at Terre Haute. No other college, university, or normal school is represented by more than one teacher. In general, the evidence shows that the teachers of the county are largely the product of the two-year normal courses in the three previously named Indiana institutions. In reporting the data of last attendance at an institution of higher learning, 118 teachers reported the following attendance: 65 teachers since 1930, 40 in the period from 1921 to 1930, 7 in the period from 1911 to 1920, and 6 previous to 1911. Only the exceptional teacher could keep progressive and abreast of the changing conceptions of education and educational needs without attending a college or university within the last few years.

Of 128 teachers reporting length of teaching experience, 11 per cent were beginning teachers, 34 per cent had taught 5 years or less, 40 per cent had taught 10 to 20 years, 10 per cent had taught 20 to 30 years, and 5 per cent had taught 30 years or over. The average number of years of experience for the 128 teachers was 9.3 years.

Of 113 teachers reporting, 43 were serving their first year in their present position, 24 had served 2 years, 15 had served 3 years, 16 had served 4 years, and 15 had served 5 years or more. One teacher had taught 16 years in the same position. The fact that 38 per cent of the teachers were serving in their present position for the first time indicates that there is too much instability and insecurity of tenure for efficiency.

The place of residence of a teacher during a period of service to any community may be a factor in the effectiveness of service to the community. Approximately half of the teachers lived in the community where they taught, while the remaining half went in and out of the community each day. Teachers living in the communities served by the school lived at distances varying from one-half a block to five miles from their schools. Those living outside the community lived many miles from the schools in which they taught, and from the communities which they served.

While 56 teachers reported living in their *home* community teaching the *home* school, 17 other teachers reported living conditions were cheaper in the school community than in the home community. Only one teacher reported living in the community because she could learn to know the pupils in her school better. Several teachers indicated a number of reasons for living in the school community.

In the study of professional interests and in-service training of teachers, only 33 per cent indicated professional books read during the year. The men teachers read professional books to a greater degree than did the women teachers. Only slightly over 37 per cent of the entire instructional staff read professional magazines regularly.

Of the 40 men teachers, 35 per cent attended summer school, and of the 93 women teachers only 26 per cent attended summer school. Minimum salaries were indicated as the main reason for lack of attendance in summer training courses. It is not expected that teachers attend school every summer, but there is some justification in occasional attendance by the teachers in active teaching service.

Developments Resulting from the Survey

1. The most distinct change in the Monroe County school picture as a result of the Monroe County School Survey has been in the active interest and emphasis placed upon reading. Every conscientious teacher has assumed a burden of responsibility for each and every pupil in her school and room. Very active interest has been shown by the efforts to improve the reading ability of each pupil. A greater number and variety of supplementary readers are being used in an effective manner. Supplies to supplement textbooks have been solicited from school officials, and in many cases the teachers have purchased

materials that were not otherwise provided. Several teachers returned to training institutions, and in some cases assistance in finding new professional reading was solicited.

2. Teacher attitudes toward problem cases were greatly improved, as shown by their studies of pupil achievements in the survey and also by their desire to re-classify pupils. A great deal has been done to eliminate the retarded pupil from the grade in which he is enrolled. Classifying these retarded pupils as special students in their grade, so that increased activity can be carried on for pupils with ability, has assisted a great deal during the present year in completing more work and having the work more efficiently done. Special grades and classes within a school or room seem to be most effective means of improving conditions under the present system of school organization.

3. A most effective change in the attitude of the township trustee has been noted by the reduction in the percentage of teaching position changes that were made for the present year. Another progressive change was the desire of the trustee to provide additional supplementary readers and teaching aids, and the purchase of such, so that the most effective teaching could be done by the teachers within the schoolroom.

4. At the time tests and questionnaires were used, considerable antagonism was expressed by the children and parents concerning the nature of the tests and questions. This antagonism resulted in curiosity which enabled us to explain the program. Following this curiosity came a decided interest in school activities and achievement. Teachers, pupils, and parents have studied results with a great deal of interest and many parents have coöperated by showing a decided willingness to have their children re-classified according to abilities, so that more effective teaching may be done.

Measurement in the Supervision and Improvement of Teaching

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THERE are three uses to which measurements may be put in the supervision and improvement of teaching: (1) the measurement of the products of instruction; (2) the measurement of the elements of teaching situations that condition the products of instruction; and (3) the measurement of the products of supervision. Each of these uses of measurement constitutes an important phase of the supervision of instruction.

The measurement of the products of instruction is undertaken to give the pupils, the teachers, and the supervisors accurate information about the progress made by pupils in the attainment of the objectives of instruction. Beginning with the general observation of the results of instruction such as any teacher makes during the process of teaching, supplemented by oral testing, written examinations, and survey testing, the specificity of the measurement of the products of instruction is increased until the exact excellencies and deficiencies of each pupil, class, and school are known. The outcome of the survey of the products of instruction should be a large body of specific information about just what each pupil knows and does not know, his special abilities and disabilities, his habits of work, his attitudes toward various school activities, his likes and dislikes, his interests and his ideals.

Of course much has been written upon the subject of measurement during the last quarter of a century; the purpose of this discussion is merely to define a little more exactly, if possible, the specific function of measurement in supervision.

A second important use to which measurement is put in the supervision of instruction is associated with the search for the causes of satisfactory and unsatisfactory pupil achievement. It will be recalled that information relative to the antecedents of satisfactory and unsatisfactory pupil achievement was a part of the information required (1) in getting the supervisory situation clearly in mind in the planning of supervision, and (2) in adjusting the plan of supervision to meet the needs of particular teachers, pupils, classes, and communities as the plan is put into operation.[1] Since both of these steps in planning make extensive use of diagnosis it might be well to run through, again, the steps of diagnosis. You will recall that in diagnostic thinking (1) one notes the presence of some particular excellency or deficiency the antecedents of which one desires to know (knowledge of

[1] See "Well-planned First Instruction vs. Diagnosis in the Supervision of Instruction." See p. 61 of this bulletin.

the specific excellencies and deficiencies for particular pupils, classes, and schools arises out of the survey of the products of instruction to which we have just referred); (2) one notes the symptoms commonly associated with the excellency or deficiency under investigation; (3) one formulates some sort of a hypothesis relative to the probable antecedents of the particular excellencies or deficiencies under investigation; (4) one checks for the presence or absence of the supposed causes of satisfactory and unsatisfactory pupil achievement; (5) one makes the necessary adjustments in the program of instruction; and (6) one re-checks the performance for evidence of improvement. Measurement is essential to step 4 in determining the presence or absence of the supposed cause of satisfactory and unsatisfactory pupil achievement, and to step 6 in checking the performance for evidence of improvement. Checking for the presence or absence of the supposed causes of satisfactory and unsatisfactory pupil achievement involves, as has already been said, the measurement of teaching ability, the measurement of the curriculum and the objectives of education, the measurement of the materials of instruction (textbooks, supplies, and equipment), and the physical environment for learning. The measurement involved in step 6 is merely a repetition of that of step 4 made to assure one's self that the supposed cause of unsatisfactory pupil achievement has been removed, or of that of step 1 made to assure one's self that the performance has been improved.

The third important use to which measurement is put in the supervision of instruction is the measurement of the products of supervision. Evidences of the effectiveness of the supervision can be found (1) in the supervisors themselves and their methods of supervision; (2) in the changes produced in the antecedents commonly associated with pupil achievement (already enumerated); and (3) in the changes produced in the pupils themselves. Except for the direct measurement of the supervisors themselves and the quality of their work as supervisors, there are no new forms of measurement involved in the measurement of the products of supervision, since the measurement of the antecedents commonly associated with pupil achievement, and that of the changes produced in the pupils are merely repetitions of those measures already discussed. The direct measurement of the supervisors and their supervision involves the application of specially devised tests, rating scales, and check lists designed for this purpose.

I wish to turn now to some of the problems associated with the uses of measurement in supervision. For the purposes of this discussion I wish to classify these problems into two groups: (1) those related to the validity, reliability, and objectivity of the instruments of measurement employed in supervision; and (2) those relating to certain uses and misuses of measurement in supervision.

In discussing the first of these groups of problems, I think it should be pointed out that there are many different kinds of measuring instruments employed in supervision: tests, rating scales, check lists, interviews, questionnaires, and various sort of mechanical measuring instruments, such as stop watches, dynometers, metronomes, yard-

sticks, etc. I think that this statement is necessary to emphasize the fact that when we speak of measurement we are not thinking merely of tests, standardized or unstandardized, for measurement is a more inclusive term than tests. When viewed from the point of view of things measured, there are again many different kinds of instruments of measurement employed in supervision, each measuring some important outcome, process, or product of instruction. We are concerned in supervision not merely with the measurement of the products of instruction, but with the measurement of all of the major antecedents of the products of instruction, among which are:

1. The pupils' intelligence; their mental, physical, and social maturity; their health, their knowledge of subject-matter, their attitudes, ideals, and interests; and their mental and social adjustment.

2. The teacher's intelligence, her social adjustments, her mental poise and balance, her knowledge of the subject taught, her health, her interest in teaching, her attitude toward boys and girls, and her skill in teaching.

3. The curriculum: its appropriateness, its interest value, its difficulty value, its experience value, and its social utility.

4. The textbooks, supplementary reading materials, and visual aids: their appropriateness, interest value, difficulty value, experience value, and social utility.

5. The physical environment for learning: heat, light, ventilation, and freedom from distracting noises of various sorts.

This list, though it is not complete, is long enough, I believe, to indicate the more important sort of measurement employed in supervision. Needless to say, the supervisor must be somewhat an expert in the field of measurement to do the things expected of him.

Coming to the matter of the validity, reliability, and objectivity of data-gathering devices, one of the very real problems of supervision is that of getting valid, reliable, and objective measures of the things that supervisors must measure in the ordinary practice of supervision. Supervisors are now measuring these products, materials, and processes of supervision the best they can; our problem is that of improving these instruments of measurement so that supervisors can do better the things that they are already doing in the practice of supervision. One of the things, for example, that supervisors have to do from time to time is to measure the quality of the teaching. I refer to this because I feel that we have been particularly inaccurate in this type of measurement both when we attempt to secure general estimates of the teacher's ability, as we frequently do in ordinary classroom visitation, and when we attempt to measure the performance more accurately by the use of tests, rating scales, and check lists.

To substantiate this point, I should like to report briefly upon two studies made at the University of Wisconsin of the measurement of teaching ability. The first of these studies related to the reliability or general estimates of teaching ability made upon the bases of general observation.[2] In this study some 65 Wisconsin supervisors were

[2] Barr, A. S. *Characteristic Differences in the Teaching Performance of Good and Poor Teachers.* Public School Publishing Co., Bloomington, Ill., 1929. 127 pp.

asked to observe two recitations of a class in third grade arithmetic and to record their estimates of the teacher's ability on a ten-point scale. I should like to call your attention to the fact that we employed in this investigation 65 supervisors, all observing the same teacher teach at the same time under the same conditions. When the results were tabulated the estimates of this teacher's ability ranged all the way from 1 to 10; 13 of the supervisors rated the teacher as excellent or superior and 13 others rated the teacher as poor or inferior. The remainder of the evaluations fell near the mean. After these calculations were completed the coefficient of correlation was calculated between the first and the second sets of ratings. The coefficient of correlation between these ratings was .30, which, as we all know, is very low and of little predictive value. In the second of these investigations the validity and reliability of some 19 data-gathering devices commonly employed in the measurement of teaching ability were studied.[8] While 14 of these 19 instruments of measurement showed higher coefficients of correlation with a composite criterion of teaching ability than the general merit estimates of supervisors, the validity of these measures was, all in all, discouragingly low—the highest of the lot being only .66. Even this coefficient of correlation was probably higher than it should have been because of a rather large spread of estimate. The reliabilities of these newer instruments were on the whole satisfactory, most of them exceeding .90. I hope that I have said enough to indicate something of the problem with which we are confronted in the measurement of teaching ability.

Besides the measurement of teaching ability there are measures of many other aspects of teaching that need improvement. If I may offer one more illustration I should like to choose one from the field of curriculum supervision. It is generally recognized that we must, in the supervision of instruction, measure in some fashion the curriculum and objectives of classroom instruction. The curriculum with which the supervisor is concerned is not that printed in a course of study and filed for future reference, but it is the living, moving, changing curriculum of the classroom. Some people have attempted to measure the curriculum of the classroom through the use of stenographic records, but even after such records have been made we have yet the problem of evaluating these records. To evaluate such activities means the development of criteria by which supervisors may judge the appropriateness of the choice, gradation, and organization of the subject-matter for teaching purposes. Just how this is going to be done is not as yet very clear, but it is perfectly clear that we are going to have to devise some ways and means of making such evaluation as valid and reliable as possible. Much the same point might be made with reference to the evaluation of textbooks, supplies, equipment, and the physical environment for learning. I shall not, however, pursue this matter further at this time.

Before leaving this subject I should like to refer more specifically

[8] Lancelot, Barr, Betts, and others. *The Outcomes of Instruction*. The Macmillan Co., New York, 1935.

to the general importance of validity, reliability, and objectivity[4] in the choice and construction of data-gathering devices. These items are not new to the expert in measurement, but they should be as familiar to the supervisor of instruction as they are to the expert in measurement. These terms cover, as a matter of fact, most of the complaints made by supervisors about measurements—objective and otherwise.

There are two things that I should like to say relative to validity, reliability, and objectivity. In the first place I should like to say that, while these concepts were first applied to tests, standardized and unstandardized, they are equally applicable to all other data-gathering devices. This is a point missed by quite a few people—expert and otherwise. One hears, for example, quite a great deal these days about the shortcomings of the questionnaires in education. Now, as a matter of fact, most of these criticisms of questionnaires reduce themselves in the last analysis to questions of validity, reliability, and objectivity. I heard a noted psychiatrist not long ago criticize very severely certain of our newer instruments of measurement and then conclude his discussion by saying that he had come, because of this situation, to rely almost entirely upon an interview technique to make the difficult analyses required in his profession. But of course an interview is merely another device for collecting data, and careful workers everywhere will insist that this technique, like all other techniques, be carefully validated.

Another field in which we have been particularly backward in employing the concepts of validity, reliability, and objectivity is in the observation of the teaching procedures. When the supervisor steps into the classroom to observe the teacher at work he is, of course, employing an instrument of measurement or a data-gathering device, if you prefer, and he must be concerned about the validity, reliability, and objectivity of the data collected through such observations. In short, all data-gathering devices should be valid, reliable, and objective.

The second matter to which I should like to refer in this connection is the false practice of accepting objective data-gathering devices as valid merely because they are reliable. I may, if I care to do so, make a fairly objective record of the amount of time consumed in teacher discussion and in pupil discussion; the number of questions asked by pupils; the amount of time given to study and to recitations, etc.; and I may even extend my visits to the classroom to the point that my record is a fairly reliable one. But even yet I do not know that these data, merely because they are reliable and objective, are of any value to me in my analysis of the teacher's work. While they may be reliable and objective, they may not be valid. Many of my own studies of the objective indices of good teaching bear out this fact. A similar tendency is observed in the field of test-construction where test-makers emphasize the reliabilities of tests to the neglect of validity. This, like the preceding fact, is an important matter with many implications for the practice of supervision.

[4] Barr, A. S. *An Introduction to the Scientific Study of Classroom Supervision.* D. Appleton-Century Co., New York, 1931. 399 pp.

I want to turn now to some of the common misuses of measurement in supervision. As a matter of fact, this discussion of the misuses of measurement is, I suspect, merely an extension of the discussion of the validity, reliability, and objectivity of data-gathering devices begun a few moments ago. I should like to refer to three misuses of measurement in particular. The first of these to which I wish to refer is that of part measurement. Now, because of the relative ease with which certain of the products, materials, and processes of learning can be measured and the difficulty with which others are measured, there has grown up in the field of teaching and supervision the practice of measuring those products and processes of instruction for which there are readily available instruments of measurement and of neglecting to measure those for which there are no immediately available instruments of measurement.

While the more tangible and less tangible aspects of instruction may be highly correlated, statistically, the effects upon the course of instruction of the constant measurement of the more tangible products of learning to the neglect of the less tangible products of learning is bound to be disastrous. Pupils prepare for and teachers teach for the outcomes of instruction upon which they are going to be tested. I am sure that this observation is not new, but I think, nevertheless, it is important. We have, therefore, the very practical problem of redirecting measurement to cover the more important areas of learning. A tremendous amount of work has been done during the last ten years in the measurement of these less tangible outcomes and processes of instruction, but as yet the most of these materials are in an experimental stage, reported only in technical publications.

Probably what we need most in supervision is a better understanding on the part of teachers and supervisors of the relationship of measurement to the objectives of education such that, having set out to attain some objective, they will from time to time examine the pupils to ascertain their progress toward the goals of instruction. This measurement of progress toward definitely set goals is important for those engaged in the practice of supervision. While we may not always find some ready-made test which will serve our purpose, with this concept in mind we can construct our own tests, objective and otherwise, such that we can measure the more important outcomes of instruction and keep this instruction directed along channels that appear most profitable to the pupils.

The second common misuse of measurement to which I should like to refer is the use of data-gathering devices for the purposes for which they were never intended. An illustration of this can be found in the many instruments of measurement that have been constructed at one time or another to serve some specific purpose, such as admission to colleges and universities, prediction of success in some particular field of activity, experimental testing, etc., that are in general circulation and have been used by teachers and supervisors not for the specific purposes for which they were intended. In addition to the general misuse of measurement there is the more specific misapplication of meas-

urement wherein tests designed to measure attitudes, for example, are used not to measure attitudes but to measure information; wherein tests designed to measure work at the twelfth grade level are used to measure work at the eighth grade level; wherein tests designed to measure academic aptitude are used to measure general intelligence, etc.

A final misuse of measurement to which I should like to refer arises out of the misuse of norms. I suppose that norms are not without value, but the supervisor's problem is not that of keeping pupils up to norms, but that of bringing up the standards of accomplishment of which they are capable. As we study these pupils at work our problem is not that of keeping Harry on a par with John or John on a par with Harry, but that of helping both of these boys to make the most of the capacities with which they are endowed. There are many ramifications to the use and misuse of norms in measurement, but I shall not pursue the matter further at this time.

In closing, I should like merely to refer again to the tremendous importance of measurement in supervision. As Jevons[5] pointed out many years ago, the condition for advance in any science is dependent upon the invention of suitable instruments of measurement. "Forces hardly suspected to exist by one generation are clearly recognized by the next and precisely measured by the third generation." So important is measurement that "the introduction of a new instrument often forms an epoch in the history of science." Those engaged in education have always measured; they are now measuring; and, as far as I can see, they will always measure. Measurement is so inherently tied up with the practice of education, with the evaluation of practice and the improvement of practice that I suspect, as time goes on, we shall measure *more* rather than *less*. Persons who appear to oppose measurement are not opposed to measurement itself, but to some particular practice of measurement. While I have, for example, criticized certain practices in the field of measurement today, I have not criticized measurement *per se*. Measurement broadly conceived has a tremendously important contribution to make to the practice of supervision.

[5] Jevons, W. S. *The Principles of Science*. The Macmillan Co., London, 1924. p. 270.

Measuring the Efficiency of Teaching First Year Algebra—A Technique in Supervision

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THE present situation in regard to the testing movement is one of criticism. When the test has been given and the achievement scores calculated, what do you have? Just a record that a certain class in a certain subject under a certain teacher and on a certain date performed as indicated by the scores on that test. In the first place, the test has tested but one thing, present status with regard to the knowledge content of that particular subject. No information is available as to the growth which has been achieved. A particular class may be exceptionally bright or dull to begin with. Then, too, there are those in any group who undoubtedly knew more or less about the content side of the subject when they first entered the class. For example, beginning algebra, ordinarily taught in the ninth grade, has been experienced by all those students who have studied general mathematics in the seventh and eighth grades. On the experience level such pupils should have an advantage over those who have had only seventh and eighth grade arithmetic. Achievement scores for the two groups should not be comparable.

In other words, comparison of achievement scores, individual or group, has indicated only one thing, viz., a comparison. The significance of any existing differences in the comparison has been an unknown quantity, in spite of the fact that administrators and supervisors have mistakenly proclaimed and declaimed otherwise. Supervision, which pretends to improve the quality of the teaching in the classroom, has fallen into the same errors of judgment as did the anthropometrist who figured growth indices from different groups of different ages until Baldwin came along with his growth measurements of the *same* groups from year to year. Achievement growth in the classroom must yield to the same treatment, for the only just appraisal of any teacher's work is in terms of how much his pupils have achieved within a given length of time according to their initial capacity and their initial ability in a given subject field.

Many educators protest that even such measurements as achievement tests are one-sided, although they agree that such tests have given a fairly accurate indication of the extent to which the pupil is able to reproduce the factual type of information which he has been taught. When, however, we come to analyze the aims that are so proudly proclaimed for the teaching of any particular subject, we discover that the amassing of facts happens to be only one of them. The question we may well raise then is: If the teacher is supposed to teach

so as to accomplish the aims that have been set for him, how can we with any degree of justice claim that we have gauged his efficiency when we have never even tried to measure the other aims?

This paper is an attempt to point the way in one possible direction as an answer to the question. For several years my students in my graduate classes have been developing what we have called improvement sheets in the teaching of the various high school subjects. Our chief efforts have been spent in formulating a set of aims and then listing the activities that should take place in the classroom to carry out these aims. We have endeavored to avoid listing those activities which occur behind the veiled curtain of the mind, because one person's guess is as good as another's in this case. Only those activities that can be observed or discovered by the teacher himself or an observer should be listed. Since all of the activities present a composite picture of what goes on in the classroom it is only fair to judge the teacher by as many of these activities as possible.

Now some of these activities can be tested by actual observation, for example, the use of the blackboard by teacher or pupils in a history class. If, during the class period, no diagrams, sketches, names, outlines, difficult words, or terms ever appear on the board, then we know that the teacher is not making the most of his opportunities to visualize his teaching of history. Other activities cannot be discovered by such direct means, e.g., a pupil's ability to recognize an improbable answer in his solution of a problem in algebra. In such cases it will be necessary to devise a type of test which may be applied to pupils, the results of which will reveal to the teacher whether or not he is accomplishing any of the aims of his teaching.

As an illustration of what might be done, I am presenting an efficiency test based on an improvement sheet in first year algebra. The improvement sheet is preceded by a list of aims in mathematics and in algebra. There follow lists of desirable activities which might be performed by pupils in an effort to achieve these aims. The activities are built upon the theory of socialized coöperation between teacher and pupil. Following pupil activities come teacher activities. As has already been mentioned, several of these activities can be tested by actual observation. At present I am not paying any attention to these. What I am offering in the efficiency test is a series of tasks whose accomplishment ought to be a good indication to the teacher of the extent to which he has put across his ideas to his pupils.

Improvement Sheet for First Year Algebra

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General Aims in the Teaching of Mathematics

1. To develop greater power, skill, and accuracy in computation.
2. To fix habits of checking work.
3. To develop a desire for quantitative thinking and reasoning.

Specific Aims in the Teaching of Mathematics

1. To increase the ability to think accurately along mathematical lines:
   a. Through the derivation, evaluation, and use of formulas.
   b. Through the use of the equation as a problem-solving device.
   c. Through the development of the ability to read and interpret graphical representations.
   d. Through the development of the ability to use directed numbers.
   e. Through the acquisition of an algebraic algebra.
2. To develop the practice of checking all work so that the pupil may experience the satisfaction that comes from confidence in the result and mastery of the subject.

PUPIL ACTIVITY

	Yes	No
A. Do members of the class coöperatively:		
1. Develop new and difficult problems and exercises?	____	____
2. Discuss the meaning of new terms and symbols?	____	____
3. Aid each other in problem solving?	____	____
4. Use knowledge of arithmetic to overcome difficulties?	____	____
5. Correct improper use of terms and symbols?	____	____
6. Discuss the method of problem solving?	____	____
7. Substantiate any criticism with good authority?	____	____
8. Help "slow" pupils to solve their problems?	____	____
9. Find mistakes when results fail to check?	____	____
10. Check methods and results with each other?	____	____
11. Formulate rules from problems just explained?	____	____
12. In discussion recognize practical application when possible?	____	____
B. Do pupils discuss and analyze story problems by:		
1. Stating all the elements of the problem?	____	____
2. Stating the relation of these elements to each other?	____	____
3. Discussing the best method to use in the solution?	____	____
4. Estimating the probable results?	____	____
5. Using the first letter of the name of the unknown quantity whenever possible?	____	____
6. Making an equation from these equal elements?	____	____
7. Translating the equation back into the language of the problem?	____	____
8. Making drawings or illustrations of the problem?	____	____
9. Keeping lists of all new words and terms?	____	____

	Yes	No
C. In solving the problems, do the pupils:		
1. Let the unknown term equal the number of items to be found?	___	___
2. Keep the equal signs in vertical order?	___	___
3. Secure all possible results to the problem?	___	___
4. Indicate by the abbreviation "Ans." the answer or set of answers?	___	___
5. Check all answers with original equations or equation?	___	___
6. Discuss all results obtained?	___	___
7. Use uniform paper for all problem solving?	___	___
8. Make neat arrangement of all written work?	___	___
D. In the treatment of exercises do pupils:		
1. Arrange literal terms in alphabetical order?	___	___
2. Arrange exponents in ascending-descending order?	___	___

TEACHER ACTIVITY

A. In presenting the new assignment does the teacher:		
1. Show the connection between the present lesson and those that have preceded?	___	___
2. Encourage the discussion of the problem and its solution?	___	___
3. Lead the class discussion of new terms, words, and symbols?	___	___
4. Explain new terms and symbols in terms of arithmetic knowledge?	___	___
5. Place the solution upon the blackboard as the pupils direct?	___	___
6. Make demonstrations a working-model for the pupils?	___	___
7. Encourage class selection and dictation of demonstration problems?	___	___
8. Permit further pupil demonstration with class assistance?	___	___
9. Consider class suggestions in the selection of homework?	___	___
10. Secure class judgment relative to the number of problems for solution?	___	___
11. Provide suitable problems for retarded pupils?	___	___
12. Provide extra work for the accelerated pupils?	___	___
B. In taking up the day's assignment does the teacher:		
1. Encourage pupil coöperation in problem solving?	___	___
2. Have pupils work problems with him rather than for him?	___	___
3. Encourage free discussion of each problem explained?	___	___
4. Review forgotten fundamentals of arithmetic?	___	___
5. Give "chalk-talks" to members of the class?	___	___
6. Introduce short-cuts wherever possible?	___	___
7. Eucourage pupils to challenge the usefulness of problems?	___	___
8. Divide the class into competitive groups for drill purposes?	___	___
9. Encourage pupils to help each other in finding mistakes?	___	___
10. Formulate simple problems to help overcome difficulties?	___	___

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	Yes	No
C. In securing algebraic motivation does the teacher:		
1. Put homework on a voluntary basis?	____	____
2. Have pupils graph their own progress in problem solving?	____	____
3. Emphasize the "how" rather than the "why" of negative numbers?	____	____
4. Charge the class with the responsibility of correct use of algebraic language?	____	____
5. Display the three or four best solutions?	____	____
6. Make "honorable mention" of extra difficult problems solved?	____	____
7. Show appreciation for commendable efforts and achievements?	____	____
8. Show the application of each topic to problem solving?	____	____
9. Correlate formulas with science and commerce?	____	____
10. Encourage pupils to introduce puzzle problems?	____	____
11. Make occasional use of mental drills?	____	____
12. Use workbooks in moderation?	____	____

Three years were spent in developing a test which might serve the purpose. Naturally it took some time and thought to analyze all the items on the improvement sheet sufficiently to select such as might lend themselves to our purpose. On the improvement sheet which you have in your hand we decided to see what we might do with the following items: A-4, use knowledge of arithmetic to overcome difficulties; A-5, correct improper use of terms and symbols; A-9, find mistakes when results fail to check; B-1 and B-2, state all the elements of the problem and the relationships of these elements to each other; B-4, estimate the probable results; B-7, translate the equation back into the language of the problem; C-1, C-2, C-3, and C-4, which are, respectively, let the unknown terms equal the number of items to be found, keep the equal signs in vertical order, secure all possible results to the problem, and indicate by the abbreviation "Ans." the answer or set of answers; C-5, check all answers with the original equations or equation; D-1 and D-2, arrange the literal terms in alphabetical order and the exponents in ascending-descending order; and, under Teacher Activity, B-6, introduce short-cuts wherever possible, and B-7, encourage the pupil to challenge the usefulness of problems.

If these various items are compared with the general aims for the teaching of mathematics and the specific ones for the teaching of algebra a very definite connection will, I am sure, be found between the two.

Problems or exercises of a mathematical content were selected which covered the range of first year algebra. It would have been desirable to give the whole test but, since it was the intention to present the material at this conference, it was necessary that the test be given during December. For this reason all such exercises or problems were eliminated which involved practice in the state-adopted text, by Nyberg, beyond the middle of December. Another factor to be considered was the time element for the administering

of the test. Since many schools in which the test might be given still had the conventional 40-minute period, it was deemed desirable to shorten the test so that it might be done within this time limit.

The main idea back of the test was this: the performance of any given class on any given section of the test might be compared with the performance of any other class on that same section of the test. The difference in the percentage performance of the two groups might then be used as a possible indication of the extent to which the teacher had definitely taught the group to perform this particular operation. It might also be possible by means of statistical procedure to determine upon a critical percentage point, above which it might safely be stated that the teacher had actually taught the pupil to do a certain operation, but below which it might be assumed that the teacher had failed in showing the pupils how to accomplish this same operation. Of course we have the fact to recognize that classes differ in ability to do work in algebra, and that consequently these differences in ability may account for certain differences in scores. Such differences in scores, however, are exhibited more in the results of what are called achievement tests.

This particular test, then, is one to discover the extent to which the teacher has taught the pupil how to do certain things that are definitely connected with the aims of the teaching of algebra rather than the performance of algebraic operations. Let me illustrate. A teacher may teach the fundamentals of the solution of the simple equation. We can test the pupils in a class to find out how well they are able to solve algebraic equations. But, has this same teacher taught the pupil to write the solution to the equation in proper, neat, and orderly form? Has the teacher taught the pupil the desirability and necessity of checking the answer in the original equation rather than the one in the equation which has been developed from the original one? It is obvious that if a mistake has been made in getting the answer and the checking is done in any equation other than the original one, the checker might not discover his error. Here is another illustration. Algebra involves a simpler, more concise method of solution than does arithmetic. Does the teacher teach the pupils to omit all unnecessary steps in order to economize on time and effort? It seems rather obvious on the face of things that the results of a test given to two or more different classes on this topic of eliminating unnecessary work might show that some classes have been taught to do this while others have not.

Through the coöperation of students who have been in former extension classes and those who are taking work in an Indianapolis extension class the first semester, volunteers were obtained to give these tests some time before the Christmas vacation. Eighteen schools and 25 different classes or teachers coöperated. To all of these schools and teachers who were willing to undertake this rather different type of testing I wish to extend my heartfelt thanks; for, without their assistance, it would have been impossible to present today any definite suggestions as to the extent to which such an efficiency test might actually be used for supervising purposes.

Pupils were not told the purpose of the test. It was given to them in the same manner as any other test which they had taken. The big difference lay in the purpose behind the test. Reference will be made to the improvement sheet for the activities which are being tested.

The scoring of the tests was done the first part of this second semester by the members of a small seminar group. It was soon found, however, that it would be impossible to get the task finished in the time which these men had to devote to it. Consequently, the rest of the tests were scored and the results tabulated by the Bureau of Coöperative Research. Each exercise or problem was treated individually. There never was or is any intention to obtain a total score for each paper. Such a score would be absolutely meaningless, just as a total score on the improvement sheet would be meaningless. In using the improvement sheet we want to know what desirable things the teacher and the pupils are doing; we also want to know those desirable things which they are not doing. Similarly, with the efficiency test we want to know which of the desirable activities tested the pupils show evidence of having been taught, and which ones they show evidence of not having been taught.

Since the final tabulation of the material was made just a week before this conference, I have not been able to apply statistical treatment which might give a critical point. For that reason I am arbitrarily using the 75 per cent point employed by Thorndike and Seashore. In the development of his tests on music, Seashore decided that, if 75 per cent of his observers said that one chord was dissonant, then it was dissonant, but if 75 per cent said it was consonant, then it was consonant. In like manner, I would like to say that, if 75 per cent of the members of any class can do the thing asked of them on any item in this efficiency test, then that class can do that very thing and the teacher has achieved a desirable activity.

The test results were scored according to the school, boys, girls, and total. Each item was scored as to whether or not it had been correctly done, incorrectly done, or omitted. In other words, every student in each class had to be accounted for on every individual problem or exercise. When this tabulation and total results had been made it was cast into another table in the form of percentages, since it is obvious that the percentage method is the only fair one whereby two or more classes may be compared as to their achievement on particular items in the test.

For convenience the percentage scores have been classed in five groups: entire omission or entirely wrong in Group 0, percentages from 1 to 24 in Group 1, from 25 to 49 in Group 2, from 50 to 74 in Group 3, and from 75 to 100 in Group 4. Two assumptions are made with regard to Group 4: first that the group which makes a score of 75 per cent or more on any one item is able to do the work; and, second, that such a class has also been taught to do the work. It is on this latter basis that the efficiency test endeavors to assist the improvement sheet in discovering if a class has been taught to do a particular job.

Unfortunately some of the items on the efficiency test cannot be satisfactorily interpreted because they happened to be tabulated in a way that did not lend itself readily to interpretation. Consequently, any reference to these items will be omitted in this discussion.

Eighteen schools and 25 teachers participated in the study. Each teacher or class has been given a number from 1 to 25 for purposes of identification.

Tables have been prepared for each section of the test. Each table is labeled to correspond with the test section that it represents. The column headed "Group" is for the percentage groups previously described. The other columns list the number of schools whose performance fell within each group.

Section I of the Efficiency Test in First Year Algebra refers to Item A-4 of the improvement sheet, using a knowledge of arithmetic to overcome difficulties in algebra. All classes registered in Group 4 on Problems 1 and 2. However, they did not do so well with fractions, Problems 3 and 4, as Class 14 was the only one to fall in Group 4 on these problems. It is rather evident that pupils cannot do addition or division of fractions, either in arithmetic or in algebra. I take it that this means that teachers of first semester algebra need very definitely to drill their classes in the arithmetic use of fractions. It is otherwise hopeless to teach the use of fractions in algebra. Problem 4 showed satisfactory results; for Problem 5a there were 24 in Group 4, and 1 in Group 2; for Problem 5b, 18 in Group 4, 5 in Group 3, and 2 in Group 2.

TABLE I. NUMBER OF CLASSES FALLING IN EACH GROUP ON SECTION I, A-4, OF THE EFFICIENCY TEST

Group	Problem									
	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b
4	25	25	25	25	1	1	16	1	24	18
3	..	..	..	..	12	4	5	1	..	5
2	..	..	..	..	10	12	4	8	1	2
1	..	..	..	..	1	7	..	13	..	..
0	..	..	..	..	1	1	..	2	..	..
Total	25	25	25	25	25	25	25	25	25	25

That section of the Efficiency Test which comes nearer to being an actual achievement test is Section II, but it is justified on the grounds that it supposedly tests the aim of the development of greater power and skill in computation. The results on this section of the test are shown in Table II. The table is self-condemnatory.

TABLE II. NUMBER OF CLASSES FALLING IN EACH GROUP ON SECTION II, AIM 1, OF THE EFFICIENCY TEST

Group	Problem 1	Problem 2
4	4	2
3	2	14
2	8	7
1	9	1
0	2	1
Total	25	25

Discussion of Section III of the test is omitted because of difficulties encountered in tabulating the results.

Section IV refers to Item A-9 on the improvement sheet, finding mistakes when results fail to check. The results on this section are given in Table III.

TABLE III. NUMBER OF CLASSES FALLING IN EACH GROUP ON SECTION IV, A-9, OF THE EFFICIENCY TEST

Group	Problem 1	Problem 2
4	20	19
3	3	3
2	1	2
1	1	1
Total	25	25

There were 18 classes that registered in Group 4 for both parts. It seems to be a general practice to teach pupils to locate errors.

Section V is omitted from this presentation because no satisfactory way was found to judge the correctness of the answers.

Section VI endeavors to find an answer to the question raised in Item B-4 on the improvement sheet, Do pupils discuss and analyze story problems by estimating results? The answer seems to be that they do not. The number of classes falling in each group is shown in Table IV.

TABLE IV. NUMBER OF CLASSES FALLING IN EACH GROUP ON SECTION VI, B-4, OF THE EFFICIENCY TEST

Group	Problem				
	1	2	3	4	5
4	..	5	..	..	2
3	11	12	13	4	14
2	10	8	10	17	9
1	4	..	2	4	..
Total	25	25	25	25	25

The corollary may well be that the teachers do not give the children training in approximations. If one of our aims is to improve quantitative thinking and reasoning we need to do more effective teaching than is now done.

Do pupils translate the equation back into the language of the problem? This part of Item B-7 of the improvement sheet is treated in Section VII of the test, the results of which may be found in Table V.

TABLE V. NUMBER OF CLASSES FALLING IN EACH GROUP ON SECTION VII, B-7, OF THE EFFICIENCY TEST

Group	Problem 1	Problem 2
3	6	1
2	15	13
1	3	8
0	1	3
Total	25	25

This item was a difficult one to test. It is questionable as to whether the ability to make a story problem out of the two equations listed gives the answer to Item B-7. But if this test item does correlate with such ability we find no class that is able to do it satisfactorily. Teachers, then, do not train their pupils to test the equation of a problem in terms of the story elements of the problem.

The next section, VIII, approaches Item B-7 from another angle. When the actual equation has been formed, can pupils analyze it into the elements that are contained in the original problem? The results on this section are found in Table VI.

TABLE VI. NUMBER OF CLASSES FALLING IN EACH GROUP ON SECTION VIII, B-7, OF THE EFFICIENCY TEST

Group	Problem 1	Problem 2
4	13	10
3	10	10
2	1	4
1	1	1
Total	25	25

The results here are much better than they are for Section VII. Even so, less than 50 per cent of the classes rate as satisfactory.

Section IX deals with the form used in the solution of an equation. One of our aims is the teaching of accuracy and neatness. From much observation I gather that teachers too often overlook this aim. Careless, slovenly work is condoned to such an extent that inaccuracy inevitably results. Items C-1, C-2, C-3, and C-4 ask the following questions: Do pupils let the unknown term equal the number of items to be found? Do they keep the equal signs in vertical order? Do they secure all possible results to the problem? And, do they indicate by the abbreviation "Ans.," the answer or set of answers? The results on Section IX are given in Table VII.

TABLE VII. NUMBER OF CLASSES FALLING IN EACH GROUP ON SECTION IX, C-1, C-2, C-3, AND C-4 OF THE EFFICIENCY TEST

Group	Problem 1
4	2
3	4
2	5
1	14
Total	25

Table VII gives rather definite proof that the four elements tested receive insufficient attention on the part of teachers. Only two classes fell into Group 4. Seventy-six per cent did not know what it was all about.

Self-checking is another important feature attached to the aim of fixing habits of checking work. Section X is related to Item C-5, Do pupils check all answers with the original equations? Checking is a desirable activity, but it fails of its purpose if it is done in any equation subsequent to the original one. If a mistake is made, checking in that particular step of the solution will never discover the error. The results on Section X are shown in Table VIII.

TABLE VIII. NUMBER OF CLASSES FALLING IN EACH GROUP ON SECTION X, C-5, OF THE EFFICIENCY TEST

Group	Problem 1	Problem 2
4	7	..
3	11	7
2	5	10
1	2	6
0	..	2
Total	25	25

The first equation gave better results than the second because, no doubt, of the presence of fractions in the latter. Whereas 7 classes were able to do satisfactorily on Problem 1, there was not a single one that gave a satisfactory performance on Problem 2. What kind of teaching does this indicate?

In order to add polynomials, it is rather necessary to arrange the terms in alphabetical order as well as in ascending-descending order of exponents. Actually, such a procedure makes no difference in the mathematical results, but it is an important habit to acquire that will insure greater accuracy in the long run. Sections XI and XII and Items D-1 and D-2 deal with this phase. The number of classes falling in each group on Section XI is given in Table IX.

TABLE IX. NUMBER OF CLASSES FALLING IN EACH GROUP ON SECTION XI, D-1, OF THE EFFICIENCY TEST

Group	Problem 1
3	3
2	3
1	14
0	5
Total	25

The results for Section XI are about the most lamentable in the whole test. There was not a single class that could do the simple task set for it.

The results on Section XII are not reported because it is evident from the test papers that many pupils misunderstood what was wanted. Instead of treating Parts (a), (b), and (c) as individual and separate exercises they tried to add them. The test directions were evidently at fault.

Section XIII is the last test item to be considered, because Section XIV was improperly checked and tabulated. Section XIII is self-explanatory and is related to Item B-6 under Teacher Activity.

TABLE X. NUMBER OF CLASSES FALLING IN EACH GROUP ON SECTION XIII, TEACHER ACTIVITY, B-6, OF THE EFFICIENCY TEST

Group	Problem 1	Problem 2
4	..	2
3	3	5
2	9	11
1	12	4
0	1	3
Total	25	25

The preliminary instructions for this section were more illustrative of what was expected than for most of the other test items, and yet only two classes could properly eliminate the wasteful steps in the solutions—and this was in only one of the two solutions. Surely teachers

TABLE XI. NUMBER OF TIMES EACH CLASS FELL IN THE VARIOUS GROUPS

Class Number	Group 4	Group 3	Group 2	Group 1	Group 0
1	8	7	12	2	..
2	11	10	5	3	..
3	6	2	13	7	1
4	10	3	5	8	3
5	12	10	4	2	1
6	6	2	8	11	2
7	8	2	10	8	1
8	8	7	10	4	..
9	9	6	8	6	..
10	13	6	9	1	..
11	11	9	4	3	2
12	9	8	6	6	..
13	8	9	5	7	..
14	15	10	4	..	..
15	11	5	7	6	..
16	14	9	5	1	..
17	10	9	7	3	..
18	6	2	13	2	6
19	14	7	5	3	..
20	7	10	5	7	..
21	11	6	8	2	2
22	13	5	6	3	2
23	8	6	6	7	2
24	10	6	11	2	..
25	9	7	9	4	..

of algebra should introduce short cuts wherever possible, but are they doing it?

Before a summary is made with regard to the test results, it might prove interesting to consider these results with respect to classes as a whole. Let us arrange a table to show how often each class is found within the five classifications of performance.

Since most of the listings under Group 4 occur in Sections I and IV, which in many instances account for as many as eight frequencies, there are not many classes, as measured by this supervisory test device, which show evidence of achieving the aims set up for first year algebra, or which are being taught these aims. Thirteen of the 25 classes have a frequency of 10 or more. Classes 14, 16, and 19 are the best taught, and Classes 1, 3, 6, 7, 8, 13, 18, 20, and 23 the poorest taught.

Summary

Reference of each table to its corresponding section of the efficiency test will reveal those phases of the teaching of first year algebra which need decided improvement. Pupils not only cannot relate fractions in arithmetic to fractions in algebra; they do not understand fractions. They fall down on a simple power test, but they do a good job of checking results. They cannot approximate or estimate results; they cannot make a story problem out of an equation, although they can interpret an equation in terms of the original problem. They are positively careless and inaccurate in the manual work involved in solving an equation. They cannot check in the original equation to discover a possible error. Their performance along this line in the case of an equation involving fractions is pathetic. They do not arrange simple polynomials in proper order for purposes of further manipulation. Nor do they know what steps to eliminate as a means of saving time and energy.

The conclusion is that the above statements constitute a serious indictment against the teaching of first semester algebra, provided we agree that the aims listed on the improvement sheet are valid. The use of the efficiency test, based on the improvement sheet, has certainly revealed instances wherein a class is not doing a desirable type of activity. In so far as this is true, this particular efficiency test, then, has proclaimed its value as a supplementary supervisory device in addition to the improvement sheet. I am firmly convinced that any teacher or supervisory official may administer it to a class and, by using the 75 per cent criterion, be able to discover those elements in the teaching of algebra which need to receive greater emphasis and better teaching methods in order to effect improvement.

This test may also be used in such a way as to answer the question raised in the first part of this paper. It may be given as soon as the algebra class has been organized at the beginning of the semester, and as often during the rest of the semester as the teacher desires. By keeping an individual record on each item for each pupil, and by using the 75 per cent criterion, the teacher will be able to measure individual and class growth in the attainment not only of performance in algebra, but, what is much more important, of the achievement of the aims for the teaching of algebra.

Efficiency Test in First Year Algebra

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Information: Grade you are in..... Boy or girl.....

You will find space to the right of the exercise or problem for any figuring which you may find it necessary to do.

I. A-4. Fundamental operations in Algebra

1. Add and write answers to:
   (a) $\$12 + \$3 + \$9 + \$5 =$
   (b) $7x + 2x + 5x + 3x =$

2. Add and write answers to:
   (a) 4 apples + 2 oranges + 3 apples + 6 oranges =
   (b) $6x + 5y + 4x + 4y =$

3. Add and write answers to:
   (a) $\frac{5}{6} + \frac{4}{9} =$
   (b) $\frac{3x}{5} + \frac{2x}{3} =$

4. Divide:
   (a) $\frac{3}{4} \div \frac{3}{8} =$
   (b) $\frac{5a}{14b} \div \frac{10a}{7b} =$

5. Multiply:
   (a) 2 hrs. 8 min. $\frac{5}{7}$ sec.
   (b) $3x^2 + 2y^2 + 7z^2$ by $\frac{4}{}$

II. Aim 1. Perform indicated operations and write answers to the following exercises. Do all the work that is necessary for the complete solution.
   (a) $(30a^4 - 25a^3 + 10a^2 - 5a) \div -5a =$
   (b) $2x + 2(6x - 2) = 4x - 3(4 - 2x)$

III. A-5. Vocabulary

Notice the following sentences. The first one is wrong, therefore the wrong word, "product," is underscored and the correct one "difference," is written above it. The second sentence is correct, hence nothing is done to it.

1. The minuend minus the subtrahend equals the difference / product.

2. The square root of 36 is ± 6.

In the following sentences there may or may not be mistakes. Correct such mistakes as occur in the same way as number 1 above was corrected. Do nothing to the sentences you think are correct.

1. The product of two negative numbers is positive.

2. The multiplier times the multiplicand gives the quotient.

3. In the expression $3x^2$, the "2" is called the exponent.

4. An algebraic expression of two terms is a monomial.

5. A quantity made up of two terms, such as $2x + 7y$, is called a trinomial.

6. To check in division, multiply the divisor by the quotient.

7. In the expression $5x^2$, the "2" is the coefficient.

8. The terms $2x$ and $3x^2$ are called like terms.

9. A collection of two or more terms is called a polynomial.

10. The product of 12 and 6 is 18.

IV. A-9. Checking results

In each of the following problems there is a mistake either in the answer to the problem itself or in the checking. Underscore the step in which the error is found. If the check shows that the answer is wrong, underscore the step where the mistake was made in solving the problem.

1. $3x + 5 = 23$
$3x = 23 + 5$
$3x = 28$
$x = 9\ 1/3$

Check
$3(9\ 1/3) + 5 = 23$
$28 + 5 = 23$
$33 = 23$

2. $6x + 4 - 3x = x + 10$
$6x - 3x - x = 10 - 4$
$3x = 6$
$x = 2$

Check
$6(2) + 4 - 3(2) = (2) + 10$
$12 + 4 - 6 = 2 + 10$
$10 = 12$

V. B-1, B-2. Problem Analysis

Before problems are solved we must find out all we can about them. Below you will find a problem properly analyzed. The difference between two numbers is 17 and their sum is 37. Find the numbers.

What things must you tell about the above problem before making an equation?

Answer: (1) The smaller number
(2) The larger number
(3) The difference between the larger and smaller numbers
(4) The sum of the larger and smaller numbers

1. Here is a similar problem *you* are to analyze. John's age exceeds James's age by 20 years. In 15 years he will be twice as old as James. Find the age of each now.

What four things must you tell about the above problem before making an equation?

1.....

2.....

3.....

4.....

2. Here is another problem which you are to analyze. Chicago and Akron are 370 miles apart. "A" starts from Akron at 35 miles per hour. Two hours later "C" starts from Chicago to Akron at 40 miles an hour. How long has "C" been on the road when they meet?

What things must you tell about the above problem before making the equation?

1.....

2.....

3.....

4.....

5.....

6.....

7.....

8.....

VI. B-4. Most reasonable answers

Below are five problems. Without solving, underline the most reasonable answer in each:

1. An agent receives 5% commission on his total sales. What must be his total sales for the year to have an income of $2400?
   (a) $60,000 (b) $50,000 (c) $30,000 (d) $20,000 (e) $10,000
2. Find N, if 67 = 32% of N
   (a) 20 (b) 200 (c) 2,000 (d) 20,000
3. Find the volume of a rectangular solid with dimensions 3 2/3 x 4 x 7 3/4
   (a) 30 (b) 70 (c) 110 (d) 140
4. A man gave to one son 1/3 of his money, and to another 1/4 of his money. He had $10.00 left. How much had he at first?
   (a) $10 (b) $20 (c) $50 (d) $200
5. If 2½ inches on a map represent 80 miles, what do 4 inches represent?
   (a) 60 (b) 120 (c) 180 (d) 240

VII. B-7. Making story problems out of equations

Look at the following equation:

$$4a + 6a = 25$$
$$10a = 25$$
$$a = 2\tfrac{1}{2}$$

We shall now express the above equation in story form. John bought 4 apples and Mary 6 apples. They paid 25 cents for them. What was the price per apple?

Write a story for each of the following equations:

1. $.04p = 50$
2. $\frac{N}{2} + \frac{N}{4} = 27$

VIII. B-7. Interpreting equations in terms of problems

Read the example and equation which follow:

Problem: John has 6 cents more than James. Together they have 48 cents. How many cents has each?

Equation: $c + c + 6 = 48$

The elements of the problem which are represented in the various parts of the above equation are:

(1) c = number of cents James has
(2) $c + 6$ = number of cents John has
(3) 48 = number of cents both have

1. In the equation following each problem below, state clearly those elements of the problem which are represented in the various parts of the equation just as was done in the above example.
   Problem: "A" is 10 years older than "B". Find their ages if the sum of their ages is 44 years.
   Equation: $A + A + 10 = 44$. What does this equation tell you?
2. Problem: One transport ship carries 400 more men than another. In five trips of the larger and three of the smaller, 19,600 soldiers were carried. How many men did each ship carry?
   Equation: $3N + 5(N + 400) = 19{,}600$. What does this equation say?

IX. C-1, C-2, C-3, C-4. Form of solution

The form of the solution of a problem may not comply with the accepted forms of Algebra. In the solution of the following problem rewrite it, if necessary, in the space to the right so that the form will be correct in all respects.

Problem:

1. A man has 3 times as many dimes as quarters. How many of each has he if the value of both together is $11.00?

$$\begin{aligned} N &= \text{the quarters} \\ 3N &= \text{the dimes} \\ 25H + 30N &= 1100 \text{ cents} \\ 55N &= 1100 \\ N &= 20 \end{aligned}$$

X. C-5. Checking solutions to see whether answer is correct

Check the following solutions. If the answer does not check draw a circle around the number where the error has been made.

1. $W + 2 + W + 2(W + 2) = 30$
   $W + 2 + W + W + 4 = 30$
   $3W = 30 - 6$
   $3W = 24$
   $W = 8$
2. $\frac{d}{6} + \frac{d}{2} = 4$
   $d + 3d = 4$
   $4d = 4$
   $d = 1$

XI. D-1. Arrange literal terms in alphabetical order.

Add:

$5c - 3b - 4a + 7d$; $\quad -5a + 6c - 3d - 2b$; $\quad 7b + 4d + 2c + 8d$.

XII. D-1, D-2. Arrange literal terms in alphabetical order with the exponents in ascending-descending order.

Rewrite each of the following polynomials in the order in which you would wish to have them, if you were going to add:

(a) $2b^2a^2 + 4b^3a - 7a^3b + a^4 - b^4$
(b) $6b^2a - 7b^3 + 3a^3 - 9ba^2$
(c) $b^5 - 8b^4a + a^5 - 5b^2a^3 - 7a^4b + 2a^2b^3$

XIII. Teacher, B-6. The use of short cuts in Algebra

One purpose in the study of Algebra is to teach us to save time. For example, in the solution of the following problem the third step is useless and should be left out because we can multiply each term in the parenthesis in one operation. A square is therefore drawn around the third step.

$2/3\ (6a + 9b - 3a + 6b)$
$2/3\ (3a + 15b)$

$$\boxed{\frac{6a + 30b}{3}}$$

$2a + 10b$

In the following equations draw a square around the step or steps which might be eliminated in order to save time:

1.
$$\begin{aligned} y + 3 &= 2y - 2 \\ y + 3 - 2y &= -2 \\ y - 2y &= -2 - 3 \\ -y &= -5 \\ y &= 5 \end{aligned}$$

2.
$$\begin{aligned} 3 - 6x - (x + 2) &= 11 - 5x \\ 3 - 6x - x - 2 &= 11 - 5x \\ 3 - 6x - x - 2 + 5x &= 11 \\ 6x - x + 5x &= 11 - 3 + 2 \\ 10x &= 10 \\ x &= 1 \end{aligned}$$

XIV. Teacher, B-7. Problems should apply to ordinary life situations.

Put a check mark before each of the following problems which is not likely to occur in actual life practice and state the reason why it is not likely to occur on the line below each statement. Do not write anything if you think the problem is a sensible one.

1. If 1/17 of a yard of ribbon costs 3½ cents, what will 5 yards cost?

   .....

2. How much money must a man invest at 4% annually to make a monthly income of $50?

   .....

3. At the rate of 3 ounces for 1 cent, what will be the cost of 10 lbs. of sugar?

   .....

4. $59 added to 8 times Mr. Smith's income tax is $375. What is his income tax?

   .....

Educational Program of the CCC Work Camps of Indiana

CHAPLAIN A. C. OLIVER, JR., State Educational Officer,
CCC Work Camps of Indiana

THE Fifth Corps Area of CCC camps includes Ohio, West Virginia, Kentucky, and Indiana. Indiana is the only state that has a unified, correlated CCC educational program. Whatever has been accomplished in this state has been due to the combined efforts of all concerned, under the active leadership of Brigadier General W. K. Naylor. The state educational staff consists of Brigadier General Naylor, commanding general; Chaplain A. C. Oliver, Jr., state educational officer and educational officer for the northern district; Educational Adviser G. O. Emick, assistant to the state educational officer; Chaplain F. R. Davies, educational officer for the eastern district; Chaplain E. F. Stegen, educational officer for the western district; and Chaplain D. A. Cassetta, educational officer for the central district. Besides these officers, there are an educational adviser, two army officers, a staff of emergency work personnel, and an average of 200 enrollees in every CCC work camp. Indiana has at present 29 work camps scattered throughout the state and an administrative and supply detachment located at Fort Benjamin Harrison, in the administrative headquarters.

Figures concerning the educational record of the CCC work camps of Indiana on March 15, 1935, are shown in Table I.

In order to make a comparative study of the educational work in the junior white, drought relief, junior colored, and veteran companies, the following data have been compiled:

TABLE II. COMPARISON OF DIFFERENT TYPES OF COMPANIES

	Number of Junior White Enrollees	Number of Drought Relief Enrollees	Number of Junior Colored Enrollees	Number of Veteran Enrollees
Enrollees taking educational work	3,048	249	600	353
Average per company	145	124	150	114
Average weekly attendance	4,983	226	670	350
Average per company	153	113	167	117

TABLE I. CCC WORK CAMPS EDUCATIONAL RECORD OF INDIANA (As of March 15, 1935)

Company	Place	Educational adviser	Strength of company	Number taking educational work	Class enrollment	Number of classes	Number of classes taught by		Average weekly attendance	Number completing grade					Number desiring university work	Number of illiterates
							CP	FEEA		8	9	10	11	12		
NORTHERN	DISTRICT															
556 JW	Angola	Paul B. Headdy	217	152	206	16	2	14	186	63	36	31	12	54	12	..
1531 JW	Medaryville	E. W. McCoy	211	135	256	20	16	4	190	54	34	35	22	45	13	..
1532 JC	Cromwell	E. N. Brindley	183	164	182	28	25	3	140	27	25	36	32	33	14	1
1563 (DR)JW	Chesterton	E. W. McCoy	205	144	184	7	1	6	134	46	35	28	22	65	..	..
1564 (DR)JW	Huntington	E. N. Brindley	223	105	145	14	8	6	92	35	35	27	53	62	48	..
CENTRAL	DISTRICT															
515 JW	Martinsville	C. W. Hohnhaus	197	168	198	12	12	..	423	86	22	13	10	37	2	..
522 JW	Jasonville	N. Z. Skelton	200	200	346	19	11	8	470	29	28	35	8	57	5	..
542 JC	Bloomington	L. A. Morris (col.)	184	159	165	17	11	6	186	28	36	28	25	34	12	4
589 JW	Spencer	H. H. Bradfield	216	172	251	18	18	..	123	52	24	31	21	62	18	..
1543 (vet.)	Marshall	Captain Winks	190	169	201	12	12	..	240	60	9	2	5	20	..	5
1557 (vet.)	Nashville	Perry McCain	184	72	87	11	10	1	40	7	2	4	4	19	..	5
1561 (vet.)	Nashville	Perry McCain	194	112	173	15	14	1	70	31	2	2	5	24	..	7
WESTERN	DISTRICT															
539 JC	Mitchell	James R. Gray (col.)	175	115	202	10	7	3	183	34	30	34	42	36	47	3
541 JW	Winslow	E. E. Zimmerman	191	178	198	28	19	9	363	35	26	26	31	62	25	4
559 JW	Washington	A. F. Johnson	233	117	206	13	6	7	169	52	33	38	25	56	3	..
1511 JW	Boonville	Lewis Childs	185	144	173	19	19	..	264	67	28	23	18	49	4	3
1513 JW	Ferdinand	Crate Beck	212	96	147	12	12	..	235	76	27	31	16	37	..	..
1526 JW	Loogootee	D. H. Carter	201	117	137	19	11	8	168	49	19	32	18	48	32	..
1536 JW	Mitchell	Carl B. Jerger	227	207	265	22	18	4	142	67	34	36	14	30	18	2
517 JC	Corydon	Earl Howell (col.)	192	162	182	12	5	7	161	30	19	30	32	60	23	2
EASTERN	DISTRICT															
513 JW	Henryville	J. W. Cory	216	122	143	22	6	16	165	63	23	34	22	75	1	..
514 JW	Henryville	J. W. Cory	222	118	138	22	6	16	156	61	25	34	24	56	..	..
540 JW	Madison	P. E. Williams	214	202	427	29	18	11	582	51	39	21	21	55	11	3
586 JW	Frectown	A. D. Holloway	173	148	236	16	8	8	190	49	21	37	10	45	7	..
596 JW	Versailles	G. C. Kimmel	180	108	203	20	13	7	161	48	17	29	17	65	15	..
1510 JW	Salem	John Densford	181	96	106	11	7	4	226	50	22	25	14	27	2	2
1514 JW	North Vernon	A. L. Crider	190	180	221	15	8	7	146	56	31	31	15	35	12	2
1528 JW	Rising Sun	R. C. Perkins	198	167	234	17	16	1	387	67	25	27	15	32	9	1
1556 (vet.)	Brownstown	A. D. Holloway	207	185	215	18	16	2	175	17	87	23	14	4	..	..
A & S JW			81	36	36	3	1	2	32	..	36	24	11	10	3	..
TOTAL			5,882	4,250	5,859	497	336	161	6,229	1,410	819	817	578	1,294	336	44
AVERAGE				142	195	16			208	47	27	27	19	43	11	1

KEY: JW—Junior White enrollees
JC—Junior Colored enrollees
DR—Drought Relief enrollees
CP—Camp Personnel
FEEA—Federal Emergency Educational Administration

The average weekly attendance of junior white companies, junior colored companies, and veteran companies showed an increase in the average enrollment, while the drought relief companies showed a decrease.

In addition, it should be noted that in making the survey of March 15 information was obtained which was not shown on the survey of December 17. It was found that the strength of the companies had remained stationary, but that the number taking educational work had increased 29 per company. The class enrollment had decreased 71 per company and the average weekly attendance had decreased 14. The average number of classes had increased two, the number of camp personnel teachers had increased 61, and the number of the Federal Emergency Educational Administration teachers had increased 47.

It is felt that the March survey revealed that more individual attention was being given the enrollees, that a better balanced educational program had been evolved, and that a more accurate survey of the educational conditions had been obtained than was evident at the time of the December survey. During the period ending December 17, first-aid instruction was required of all enrollees in CCC camps. During the period ending March 15 only the leaders and assistant leaders were required to take this subject. This in a large measure accounts for the decrease in class enrollment.

Before the appointment of educational advisers in March, 1934, the educational work in the camps had been organized to the point where 2,700 out of a total strength of 4,500 members of the CCC work camps were enrolled in classes. The subjects taught were those found in the curriculum of the average grade school. The methodology employed was similar to that used in these schools and the teachers used were the members of the camp personnel, which consisted of army officers, members of the Emergency Conservation Work staff, and those enrollees who were scholastically qualified to teach. These teachers served on a voluntary basis without pay and gave of their time after working hours. Classes were held the first five nights of each week. Upon the advent of the educational advisers in March, 1934, this program was at first continued *in toto*, but at present the CCC educational program includes (1) instruction in grade, high school, and college subjects; (2) visual education; (3) special course projects; (4) organization of courses based on camp work experiences; (5) special educational projects; and (6) counseling with CCC enrollees.

Instruction in Grade, High School, and College Subjects

The teaching of subjects similar to those offered in the usual grade, high school, and college curriculum was continued after the educational advisers took charge of the work.

Arrangements were made through the office of the superintendent of public instruction, of the state of Indiana, whereby enrollees taking examinations in high school subjects might receive credit in their home high school. The teachers of these courses consist of the educational advisers, company officers, personnel of the Emergency Conservation

Work, and teachers whose services have been lent by Winston Riley, Jr., state director of the Federal Emergency Educational Administration. One hundred and sixty-one such teachers either give courses in the camps or teach in local schools to which the enrollees are taken by trucks.

Recently, through the courtesy of Dr. William Lowe Bryan, president of Indiana University, the services of Dr. Melvin S. Lewis, professor of education, School of Education, Indiana University, were lent to the Indiana CCC in an endeavor to work out a method of extension work whereby the 336 CCC enrollees who indicated a desire for university work might obtain university credit.

Visual Education

When the educational program for the CCC work camps in Indiana was first set up, Director R. E. Cavanaugh, of the Extension Division of Indiana University, was consulted and he and his division gave much valuable advice and assistance. Perhaps the most valuable project inaugurated at this time was visual education. Through the coöperation of the visual education section of the Extension Division of Indiana University, vocational pictures were shown in every camp in the state and had a peak of attendance of over 7,500 enrollees per month. The educational reports for the month of March, 1935, show that 244 reels of pictures were shown in the CCC camps of this state with an attendance of 7,579. Some of the subjects treated were National Parks, Rubber, Conservation, and American History.

Special Course Projects

It was found that the more formal program did not hold the sustained attention of the desired number of enrollees. It was necessary to do something different to maintain interest and an attempt was therefore made to devise a methodology which would not only arouse interest, but would enable the educational adviser to direct intelligently the CCC enrollees along those lines of study for which they have background and aptitude. Such a plan was believed essential if the enrollees were to fit into a changing social order successfully and to contribute their best to society. Out of this need grew 35 projects which consist of courses of study arranged on a unit basis of two lessons each week in a given subject for a period of six weeks. Major General A. J. Bowley, the commanding general of the Fifth Corps Area (Indiana, Ohio, Kentucky, and West Virginia) and Mr. Nat T. Frame, who is the educational adviser of that area, are enthusiastic supporters of the CCC educational program. Too much credit cannot be given to General Bowley and Mr. Frame for their vision and guidance. Seeing what had been accomplished along the line of special course projects in Indiana, General Bowley directed that the Indiana educational officer publish these courses for the benefit of all the CCC work camps in the Fifth Corps Area. The first courses were sent out in December, 1934, and were made up of 245 projects in each course; the record of courses published to date is given in Table III.

TABLE III. TOTAL NUMBER OF PROJECTS SENT TO CCC COMPANIES IN THE FIFTH CORPS AREA

Course	Number of Projects	Course	Number of Projects
Advertising	268	Letter writing	267
American family	357	Personal hygiene	416
American history	245		
Auto mechanics	349	Photography	309
Botany	309	Practical radio	311
		Practical arithmetic—Unit I	311
Budget making	280	Practical arithmetic—Unit II	344
Business English	417	Rating scale	245
Business and social customs	326		
Camp telephone and electrician	260	Safety	331
Conservation	1,493	Salesmanship	279
		Sanitation	319
Dramatics	326	Saving our good earth	245
Education through recreation	263	Social relations and government	358
Electricity	305		
Forestry	372	Surveying and reclamation	331
Geography	389	Typewriting	524
		Speaking without embarrassment	310
Keeping up with the news	312	Use of leisure time	245
Landscape gardening	301	Water	288
Leadership	378		

In the publishing of these 35 courses of study, we have cut 535 stencils and mimeographed 176,580 pages. All this work has been done at Fort Benjamin Harrison and all the courses except Conservation, Forestry, Rating Scale, Use of Leisure Time, Water, Botany, and United States History have been written by men in the CCC Work Camps of Indiana. The courses in Forestry, Rating Scale, Use of Leisure Time, and Water were written by men outside the state. The course in Botany was contributed by Dr. Paul Weatherwax, associate professor of botany, Indiana University. The course in American History was contributed by Mr. Ross Lockridge, coördinator of adult education, FERA, state of Indiana. A large portion of the course in Conservation was written by Mr. W. C. Palmer, technician-forester, of the office of the state forester, Indiana. These courses are planned as stepping-stones to a more comprehensive study of the subjects indicated. They are constantly undergoing revision and constitute a unique experiment in the adult educational field.

Enrollees take these subjects on a voluntary basis. Classes are held from 6 p.m. to 9 p.m. on Monday, Tuesday, Wednesday, Thursday, and Friday evenings of each week.

Organization of Courses Based on Camp Work Experiences

Work experiences are perhaps some of the most effective forms of education. In the camps the work experiences are many and varied.

A recent survey revealed that some 35 different types of field projects were being carried on in the CCC camps in the state. A study was made and the projects were found to group themselves into the following major divisions: road and trail construction, erosion control, landscaping, laying of water mains, fire tower construction, telephone line construction, bridge building, forestry work, water reservoir construction, septic tank construction, and building construction. Of these, erosion control, forestry work, and building construction were the most frequently mentioned. One can scarcely realize the large number of work or vocational experiences to be gained through the projects listed. The camp advisers were asked to list the definite occupational experiences of the men in camp on March 15, 1935, together with the number of men engaged in each. Table IV gives this information.

TABLE IV. OCCUPATIONAL EXPERIENCES OF THE MEN IN CAMP ON MARCH 15, 1935

Occupational Experience	Number Engaged	Occupational Experience	Number Engaged
Carpenters	261	Concrete form makers	10
Tree planters	182	Tractor operators	10
Stone masons	154	Creosote plant workers	9
Truck drivers	84	Electric generator operators	8
Concrete mixers	80	Hoisting machine operators	8
Surveyor's assistants	67	Tool house men	7
Plumbers and pipe-fitters	63	Sign painters	6
Woodworkers (hewers)	56	Pump and engine operators	6
Brick masons	39	Saw mill workers	5
Blacksmith's helpers	31	Nursery workers	5
Compressed air hammer operators	25	Animal trappers (vermin control)	5
Electricians	20	Fire tower guards	4
Road grader operators	17	Mechanics	4
Dynamiting operators	17	Log house framers	4
Structural iron workers	14	Saw filers	4
Stone crusher operators	13	Mortar mixers	3
Engineer's assistants	13	Geologist's assistants	2
Fish hatchery workers	12	Timber cruisers	1
Concrete finishers	12	Timekeepers	1
Seed gatherers (trees)	10	Total	1,291

A total of 1,291 enrollees were reported as working on job projects from which they received some definite occupational training. This does not tell the whole story of occupational experiences in the camps since this survey included only the experiences at a particular time. In many camps, especially the State Park camps, the projects have varied greatly. This means that many projects have been completed, the occupational experiences of which were not included. Mr. M. Z. Skelton, educational

adviser of CCC Co. 522, made a study in his camp of the number of men who had received special training along various lines for the period from November 1, 1934, to March 15, 1935. Following is a list of these experiences,[1] with the number of enrollees receiving special training:

Bricklayers—Eighteen men have had extensive experience in working with bricklayers; 9 have done actual bricklaying themselves; and 3 are specialized as "mortar men" (men who mix mortar suitable for bricklaying).

Tree men—A total of some 120 men have had extensive experience in removing and transplanting trees.

Nursery men—Four men have become specialized nursery men. One man is considered expert on classifying trees by name.

Sod-cutters—Sixty men have had much experience in cutting sod.

Sod-laymen—Sixty men have had much experience in laying sod.

Surveyors—Twelve men have received experience as linemen, chainmen, etc.

Carpenters—Thirty men have worked extensively as carpenters. About 12 have become A-1 carpenter-helpers.

Plumbers—Six men have had extensive training in pipe connecting, tile-laying, and mechanical plumbing (such as setting and connecting sewage pumps). One man is an expert in the field.

Electricians—Three men have done considerable minor electrical work.

Draftsmen—Two men have been drafting apprentices. One was very good, the other one average.

Woodworkers—Twelve men have had extensive experience in working rough timber into rustic bridges and framework for rough-hewn shelters.

Mechanic—One man has become an expert mechanic on Chevrolet trucks.

Clerks—Three men have become efficient in government work.

Truck drivers—Twelve men have had experience driving 1½-ton Chevrolet dump trucks.

Road machinery operators—Twelve men have had experience as graded operators. Five men have had experience as concrete mixer operators.

Foremen—Approximately 35 men have become enrollee foremen with extensive experience.

The field work experiences in Mr. Skelton's camp are perhaps common to other camps of the same nature.

In addition to the field work experiences, approximately 14 men received definite occupation experiences as a part of the camp overhead in each camp. The most important positions of this nature in each camp, with the number affected are:

[1] These figures are based on work accomplished—these are not averages but include the total number of men who have received special training along various lines enumerated.

Senior foreman	1	Canteen steward	1
Mess steward	1	Company clerk	1
Storekeeper	1	First-aid attendant	2
Assistant storekeeper	1	Assistant to educational adviser	1
Cook	5		

Although incomplete, the data listed give some indication of the types of work experiences carried on in the CCC work camps which have a close relationship to occupations carried on in civil life.

One of the important phases of the educational program is the offering of class instruction in the camps which will supplement the work experiences in the field or office. Much has been done along this line, but much remains to be done. Where the work is quite well defined, such as truck driving, it is not difficult to offer courses in auto mechanics which will provide the required information regarding the operation and care of motor trucks. The courses and procedures in this field have been quite well developed. In this connection two airplane engines have been obtained and are being rotated among the camps of the state on a definite schedule. Other equipment, such as automobile motors, have been obtained by the various companies for demonstration purposes in the course. Such procedures are likewise possible in the field of clerical work, where typing and shorthand may be taught. Typewriters may be rented for instructional purposes at a very nominal sum. The real task comes in the establishment of classes which will meet the needs and supplement the work of those who are employed on a variety of projects such as shelter house construction, pipe laying, erosion control, etc.

A job analysis technique is being used in attacking this problem. With the educational adviser and the ECW foremen coöperating, studies are being made in some camps to determine "what the workman does and what he must know" on the various projects. By analyzing the data obtained, they are able to select the identical elements on at least two projects and organize formal instruction around the common elements. It is on this basis that the courses in Blue-Print Reading, Surveying, and Use of Tools and Materials are being offered in some of the camps with the instruction closely linked to the problems encountered in the field.

A plan whereby such courses can be offered in the evening, with the special instruction necessary to carry on a particular project being offered on the job, would seem to be the most desirable plan to follow.

Following are some of the courses being offered in the various camps which are closely related to the work experiences of the enrollees:

Cooking	Bookkeeping
Baking	Blue-print reading
Landscaping	Mechanical drafting
Horticulture	Leadership
Dam construction	Foremanship
Forestry	Carpentry
Typing	Tree nursery management

Auto mechanics	Bridge construction
Plumbing	Pipe laying
Electricity	Use of tools
Surveying	Mess management
Shorthand	Telephone operation
Practical arithmetic	Timber cruising
Woodwork	Erosion engineering
Painting	Safety
Tool repair	Tool sharpening

The ECW personnel are to be commended for the part they have taken in the development of the education program in this state, since it is through their efforts that many of the courses of this nature are made possible. Mr. Myron L. Rees, director of State Parks, and Mr. Ralph F. Wilcox, state forester, have enthusiastically given their support to the entire program and have also sponsored the development of and offered a course in Conservation.

Special Educational Projects

It is the objective of those in charge of the Indiana CCC educational program to leave no project untried which presents educational possibility for the CCC enrollees. In keeping with this objective three special fields have been cultivated. These fields are as follows:

1. *Convocation.*—A convocation of one hour each week has been inaugurated in all camps. For this the attendance of all enrollees is compulsory. At this meeting the educational adviser has an opportunity to sell educational ideas to the enrollees and to enroll them in courses of study, outside speakers bring special messages along educational lines, and the work superintendent describes the conservation projects upon which the enrollees are employed.

2. *Education through recreation.*—Emphasis has been placed upon the possibility of education through recreation. A course of study on this subject has been put in, in the foreword of which is the statement: "In establishing an educational program the company officers and educational advisers are reminded of the possible contribution that recreation can make to the educational development of the enrollees within their care. They must be convinced of the value of the idea that 'Education through Recreation' is both feasible and practical.

"Any educational-recreational program must be flexible enough to meet the needs of the individual camp, but it is felt that certain basic objectives should underlie the program of all CCC camps. The CCC enrollees should be taught to find PLEASURE in all the recreational activities which will help them to occupy their leisure hours profitably; in addition, the lessons of loyalty to group, fair play, and self-sacrifice should be emphasized.

"With these things in mind, the year is divided into three periods, and suggestive programs of 'Education through Recreation' are outlined under each." In each period the camp contests culminate in a state championship held at Fort Benjamin Harrison.

3. Leisure-time activities.—It is felt that the solution of many of the social problems that confront the CCC enrollees lies in the constructive use of leisure time. Self-expression is encouraged by the publishing of 22 camp newspapers, and a weekly state news bulletin, called the "Hoosier Civie," is sent out by the state educational officers. A state oratorical contest is held; camp shows are organized; and hobbies are promoted by the use of stamp clubs, nature study clubs, photography clubs, radio clubs, and manual training shops. Through the coöperation of Mr. Riley's office it is planned that a teacher of hobbies shall visit each camp in the state in order to motivate more thoroughly the enrollees to participate in these desirable leisure time activities.

Counseling with CCC Enrollees

Counseling with the individual enrollee regarding his educational and vocational problems plays an important part in the CCC educational program. Education Forms Nos. 2A and 6A, together with a certificate issued to the enrollee at the time of his discharge from the Corps, give a complete record of his activities and attitudes while in camp. The educational adviser must secure the information contained in these forms by personal interview. When an enrollee is discharged from the CCC, copies of the forms mentioned are forwarded to Corps Area Headquarters and are later sent to the Department of Labor, Washington, D.C., to be used as a basis for placement upon the enrollee's return to his home community.

One final phase of this subject deserves attention. The number of CCC enrollees voluntarily taking courses of study in Indiana is 4,250, but this does not give a full measurement of the interest evidenced by enrollees in the CCC educational program. During February, 1935, I visited Camp 1526 at Loogootee. This camp is in the western district. I happened to arrive on an evening when the eight basketball teams of this district were playing in the local high school gymnasium for the district championship. The gymnasium rooms are parallel to the high school building and these buildings are only 30 feet apart. From 6 p.m. to 9 p.m. the cheerings could be heard distinctly in the high school proper. More than 20 enrollees had classes that evening. They did not have to attend those classes, but, although they were interested in their team, not a man cut class. Such a genuine interest not only speaks well for the educational adviser of that camp but, because it is a true picture of educational interest throughout the state, it tells of the high ideals of Indiana enrollees and pictures a group of young men worthy of the best educational program it is possible for us to evolve.

Well-Planned First Instruction vs. Diagnosis in the Supervision of Instruction

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THE appearance of *The Thirty-fourth Yearbook*[1] of the National Society for the Study of Education, entitled *Educational Diagnosis*, has brought to the foreground again the issue of well-planned first instruction versus diagnosis in teaching and supervision. While this is not a new issue in education, it is one that is important enough to warrant careful consideration. The proponents of educational diagnosis criticize the conventional program of classroom instruction by saying that it provides only mass instruction of the most general sort, with little or no attention to the particular needs of individual teachers, pupils, and classes. The proponents of well-planned first instruction criticize diagnostic teaching and supervision by saying that the concept is really after all a rather sickly one, and that there would be no need for diagnosis if the instruction were well planned in the first place.

In discussing this subject this afternoon I should like to discuss not so much the relative merits of these two supposedly conflicting theories of teaching and supervision, since it seems to me that neither of these theories contains the whole truth, but to discuss a means of integrating these two points of view into a more comprehensive view of the teaching and supervisory process. I assume this integrative position not because I wish to present some mere compromise, but because I believe that a more accurate picture can be had of the practical problems of teaching and supervision by thinking of well-planned first instruction and educational diagnosis, not as conflicting approaches to the problems of teaching and supervision, but as components of some larger whole that teachers and supervisors should thoroughly understand if they are to be as effective as they should be in their everyday teaching and supervision. I shall attempt to present this integrated view of the supervisory process as a series of steps which I believe are fairly representative of the practical problems of supervision on the one hand and the science of supervision on the other. It is, then, this overview of the supervisory process that I wish to present this afternoon.

If we consider the planning features of supervision first, I suppose that it goes without saying that one of the very first steps in planning is to *get the situation clearly in mind.* While getting the situation clearly in mind ordinarily means, in practice, nothing more than getting in mind certain very superficial facts about the grades, subjects, and

[1] Brueckner, Leo J., and others. *The Thirty-fourth Yearbook* of the National Society for the Study of Education *(Educational Diagnosis.)* The Public School Publishing Co., Bloomington, Illinois, 1935. 563 pp.

number of pupils involved in a given supervisory situation, to get a really adequate grasp of the situation to be improved involves two types of information in order to determine the factors that limit or condition the achievement of the pupils in particular teaching situations. In the first place, it involves *the careful collection*, through the use of appropriate instruments of measurement, *of a large body of facts* about the specific teaching situations to be improved: the achievement of the pupils; their intelligence, maturity, training, and methods of work; the teachers and their methods of teaching; the curriculum and the teacher's objectives; the materials of instruction (textbooks, supplies, and equipment); and the physical environment for learning. In the second place, getting the situation clearly in mind involves *the evaluation of the facts*: the evaluation of the achievement of individual pupils and classes to determine their particular excellencies and deficiencies, and the evaluation of the facts associated with the pupils and their methods of work; the teachers and their methods of teaching; the curriculum and the teacher's objectives; the materials of instruction (textbooks, supplies, and equipment); and the physical environment for learning. Getting the situation clearly in mind involves, therefore, two parallel streams of information, the one growing out of the study of the particular teaching situation itself and the other growing out of the supervisor's experiences with or systematic study of other previously observed similar situations.

This merging of the general and the specific in the planning of supervision can be well illustrated from the field of educational objectives. The specific needs of particular teachers, pupils, classes, and communities can be determined, of course, only by studying particular teachers, pupils, classes, and communities. But the data for evaluating particular teaching situations are not contained in the particular situations themselves; they are in the mind of the observer who directs the investigation; they are the standards of value, such as health, happiness, service, and worthy home membership, which the supervisor brings to the evaluation of the particular situations from his past experience with similar situations. While we shall not concern ourselves here with the techniques by which one determines the specific objectives for particular teaching situations, it is important for our purposes to note that what a supervisor sees in a particular teaching situation is determined partly by the situation itself and partly by his system of values.

In brief, then, effective planning is always done with reference to a particular teaching situation, such as Miss Blake's class in sixth grade arithmetic, Mr. Hill's class in ninth grade mathematics of the John Hancock junior high school, the Westmoreland County schools, and the Dearborn public schools; and the first step in planning is getting the situation clearly in mind. While supervisors may, and frequently do, plan when they have in mind only a very superficial knowledge of the situation to be improved, effective planning can take place only when there is detailed information about the specific learnings and the antecedents of the learning in particular teaching situations. To evaluate the data derived from the study of particular teaching situations in-

volves the application of predetermined systems of values about the important aspects of teaching. To do this involves, however, both the diagnostic and the well-planned first instruction approaches to supervision.

The second step in educational planning is that of *getting ideas about what to do.* After the situation is clearly in mind, one is then confronted with the problem of knowing what to do about it. In searching for ideas about what to do, one may turn to his own personal experiences with similar situations or to the experiences of other persons. The experiences of other persons may be derived from conversations with them or from written reports: summaries, books, etc. If the reports are the outgrowth of systematic studies of difficult teaching situations, they are likely to take the form of books on the history, science, or philosophy of education. From the point of view of the form of thinking involved, this second step in educational planning is merely the second step in the process of problematic thinking; from the point of view of its content, it involves all of one's own experiences and the whole of the science, history, and philosophy of education. It is therefore from these generalized experiences that one gets ideas about what to do in specific teaching situations. The second step in educational planning is, therefore, principally an application of generalized experience.

The third step in educational planning is *the formulation of a plan.* Having gotten the situation clearly in mind, and having surveyed past experiences with similar situations for ideas about what to do, one comes next to the formulation of the plan itself. In the field of instructional planning this plan may take the form of a course of study, a topical outline, or a daily lesson plan. Now there are many things that might be said about the plans of teachers and supervisors, but the aspect of planning to which I should like to call particular attention here is that all plans are hypothetical. If I decide in the formulation of my plan of supervision to apply the principle of functional learning to some particular instance of learning, I must remember that I am employing a generalization derived from the study of similar situations which may not hold true for the particular situation with which I am now confronted. Dewey[3] pointed out a number of years ago the fact that the generalizations derived from laboratory investigations do not necessarily hold true for the uncontrolled conditions of the classroom and that educational generalizations must not be applied in a rule-of-thumb fashion. This is not a criticism of the scientific study of education, as Dewey points out, but a means of emphasizing the hypothetical character of scientific generalizations.

While I think that this observation of Dewey's about laboratory research is correct, I think that it is also true and important for educational planning that all educational generalizations, whether derived in the laboratory or elsewhere, are not necessarily true for particular situations, though they may be true for situations in general. This

[3] Dewey, John. *The Sources of Science of Education.* (Lecture delivered before Kappa Delta Pi.) Horace Liveright, London, 1929. pp. 28-30.

may seem a bit far-fetched at first thought, but if one thinks about the matter for a while one can see that it could not be otherwise. Let us take, for example, an experimental study of the relative merits of distributed versus concentrated practice in learning. If we had the data here before us we could see that, while distributed practice is on the average better than concentrated practice, there are, however, many individual exceptions to this general rule of learning. This is not merely a happenstance; it is a significant feature of the situation under consideration. This aspect of the data is particularly important for our purposes because it indicates clearly the limitations of the general principle approach to learning, teaching, and supervision inherent in the concept of well-planned first instruction. That this limitation is present does not, however, mean that the general principle approach should be abandoned. It means only that the full worth of this approach to teaching, supervision, and learning will be realized only when we add to this body of generalized information, knowledge of the specific needs of particular teachers, pupils, classes, and communities for whom we as supervisors are responsible. I believe that the point that I have attempted to make here is one with broad implications for the practice of supervision.

Before leaving this subject I should like to refer to the fact that there are two clearly distinguished brands of educational psychology, about which all of us have heard much during the last ten or twenty years, which parallel these two frequently contrasted approaches to teaching and supervision. One of these has for its purpose the development of generalizations of various sorts about learning, as, for example, laws of learning, rules for effective study, etc. The other takes for its content the mental-motor processes involved in specific instances of learning, as, for example, learning to add "2 plus 2 plus 3"; learning to read the sentence "I see a cat"; and learning to work effectively at tasks requiring group activity, etc.

By means of numerous experimental studies of learning, the first group of psychologists has attempted to build up a body of generalized information about the conditions most favorable to learning. Among such generalizations are "Learning is reacting," "Learning by wholes is more economical than learning by parts," and "The individual tends to repeat, and learns quickly those reactions which are accompanied or followed by a satisfying effect, and he tends not to repeat and hence not to learn those responses which are accompanied or followed by an annoying state of affairs."

The second group of psychologists has not been interested so much in the general conditions for effective learning as in the processes of learning, illustrated by the study of the handwriting movement by Freeman and the study of eye-movement in reading by Buswell, Gray, and Judd. In the latter research the study of eye-movements was not an end in itself, but it was an observable index to the mental processes involved in reading. The diagnostic approach to education is an outgrowth of this individual operational approach to learning. Therefore,

in this discussion of well-planned first instruction versus diagnosis we are dealing with an issue of many ramifications.

The fourth step in planned supervision is that of *putting the plan into operation.* While here again there are many ramifications to this subject, I shall refer now to only three. In the first place some decision must be made as to how the plan is to be put into operation: whether it is to be put into effect all at once or a part at a time; whether the announcement is to be made by bulletin, or by means of conferences with individual teachers, or by means of teachers' meetings. I shall not pursue this matter further. In the second place there are many routine matters, such as the typing, printing, and mimeographing of essential verbal materials and the purchasing and distributing of textbooks, supplies, and equipment, and the like that will need to be taken care of in putting the plan into operation. This, too, I shall not discuss further. In the third place, there are the teachers who must be trained in the use of new materials and methods of teaching. This, too, has many ramifications and I shall merely say that if the instructing of teachers is to be done effectively, careful attention must be given to the methods of this instruction; the maturity of the teachers; individual differences in teaching ability; the attitude of the individual teachers; etc. The issue here between the well-planned first instruction and the diagnostic approaches to supervision arises out of the methods of training teachers in service. If we assume that supervisors are all-seeing and that good supervision is merely telling teachers what to do, then the whole matter of training teachers in service is a relatively simple one. But some supervisors feel that merely telling teachers what to do is not an effective way of training teachers in service. To them, supervision is instructing teachers as to ways of dealing with specific teaching situations and not merely bringing about the general improvement or upgrading of teachers in service. The first of these ways of thinking of training of teachers in service grows out of the concept of supervision as diagnosis, and the second out of the idea of supervision as well-planned first instruction. The problem of those engaged in the practice of supervision is that of effectively bridging the gap between these two points of view. I shall not pursue the matter further at this time inasmuch as I desire to discuss the training of teachers in service in some detail in a later discussion.

The fifth step in well-planned supervision is *the adjustment of the plan to meet the needs of the specific teacher, pupils, classes, and communities.* We have already spoken of adjusting the plans of supervision to the needs of individual teachers, so we will speak principally here of adjusting the plan of supervision to meet the needs of specific pupils, classes, and communities. Such a process involves: (1) determining the specific excellencies and deficiencies of particular pupils, classes, and communities; (2) searching for the causes or the antecedents of satisfactory or unsatisfactory achievement; and (3) adjusting the program to meet the needs of individual pupils, classes, and communities.

To determine the specific excellencies and deficiencies of particular pupils, classes, and communities one must carefully evaluate the learning of individual pupils and of classes in particular communities. This evaluation involves, first, as precise measurement as is practicable of the products of learning made with reference to the objective of education; and, second, the comparison of each pupil's achievement with his capacity to achieve. I think I should point out that the comparison here referred to is no mere comparison with norms or standards but a comparison of the pupil's actual achievement and his ability to achieve. The end product of this analysis, as far as the supervisor is concerned, is a list of specific excellencies and deficiencies in reading, spelling, arithmetic, history, English, citizenship, health, social adjustment, etc., which the supervisor may use in making his supervision more exact and definite.

Having determined the specific excellencies and deficiencies of the individual pupils and classes for whom the supervisors may be responsible, the supervisor's next task in working coöperatively with the teacher is that of determining the antecedents of the excellencies and deficiencies observed. This is a matter of diagnostic thinking and involves: (1) observing the symptoms commonly associated with particular excellencies and deficiencies; (2) formulating hypotheses relative to the probable causes of the observed excellencies and deficiencies; and (3) checking for the presence or absence of the supposed antecedents of particular excellencies and deficiencies.

The antecedents of observed excellencies and deficiencies may lie, as has already been pointed out, in the teachers and their methods of teaching; in the pupils and their methods of work; in the curriculum and the teacher's objectives; in the materials of instruction (textbooks, supplies, and equipment); and in the physical environment for learning.

The whole sequence, then, involved in adjusting the program of instruction and supervision to meet the needs of particular teachers, pupils, classes, and communities resolves itself into the following part activities:

1. Agreement upon the outcome of instruction
2. Measurement of the products of learning with reference to the desired outcomes of instruction
3. Comparison of each pupil's achievement with his capacity to achieve
4. Notation of the specific excellencies and deficiencies of particular pupils, classes, and communities
5. Search for symptoms commonly associated with particular excellencies and deficiencies
6. Formulation of hypotheses as to the probable causes of satisfactory and unsatisfactory pupil achievement
7. Check for the absence or presence of supposed causes of satisfactory and unsatisfactory pupil achievement
8. Adjustment of the program to meet the needs of individual teachers, pupils, classes, and communities
9. Re-check of the products of instruction to assure one's self that the outcomes are satisfactory

The sixth and last step in well-planned supervision is *the evaluation of the plan.* Evidences of successful supervision can be found in the changes produced in the pupils themselves or in the antecedents essential to learning, such as we have already enumerated.

We have heard much during these last twenty or thirty years about the importance of evaluating the products of instruction. I am merely suggesting here that we apply the same idea to the products of supervision. While there is not time to pursue this matter further here, it involves, in addition to the development of adequate instruments for the measurement of the products of learning, the development of adequate instruments for the evaluation of the curriculum and objectives. Only a mere beginning has been made in the evaluation of the products of supervision.

In brief, then, what I have attempted to do this afternoon is to present a practical scientific program of supervision which brings together in a single integrated approach the two supposedly conflicting theories of teaching represented in the conception of supervision as well-planned first instruction and educational diagnosis. The steps in this proposed program of planned supervision, to view them again, are:

1. Getting the situation clearly in mind
2. Collecting ideas about what to do
3. Formulating a plan of action
4. Putting the plan into operation
5. Adjusting the plan to meet the needs of particular teachers, pupils, classes, and communities
6. Evaluating the effectiveness of the plan

While the steps in the proposed program of integrated supervision have been stated in terms of the practical problems of classroom supervision, I have kept in mind the facts (1) that good supervision is good thinking; (2) that good supervision is democratic, involving the cooperative efforts of teachers, pupils, and supervisors working together; (3) that good supervision is definite, pointed, and accurate in all of its methods and procedures; (4) that good supervision is goal-centered, always regarding particular teaching procedures, means of instruction, and content as secondary and temporary; and (5) that good supervision is scientific and problematic in both its form and its content.

Higher Education and the Social Order

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THE department of education at the University of Chicago offers a rather popular course entitled "The School and the Social Order." The students, with their usual insight into conditions, have nicknamed this course "The School and the Social *Dis*order." Whether modern society is an *order* or a *disorder*, it may be taken for granted that there is a common understanding concerning the meaning of the term, "social order."

A definition of the other term in the subject of this paper cannot be dismissed so lightly, for an exact and complete description of "higher education" has not yet been prepared. Historically there has perhaps been a form of higher education in practically every civilization that has ever existed, even in the most primitive societies where a certain amount of esoteric knowledge is passed on to the limited few. In its modern, institutionalized form, higher education had its beginning only seven or eight hundred years ago, with the founding of the medieval universities at the time of the Revival of Learning. Since that time the type of instruction recognized as higher education has exhibited such a variety of forms that any categorical definition of it seems almost impossible.

There are at least five bases from which a definition of higher education may be approached. The first, and perhaps the one most commonly used, sets up the definition in terms of institutions. Higher education, on such a basis, might be designated as the type of activity carried on in colleges and universities; or a somewhat more penetrating analysis might describe higher education as that stage which follows the completion of the secondary school. Unless one is thoroughly familiar with the make-up of the institutions used to define higher education, however, it is obvious that the definition is of little help. In fact the task of defining these other institutions is in itself equally difficult with that of defining higher education. It seems obvious, therefore, that the definition of higher education in terms of institutions is of little assistance and of little general validity.

Another approach to the definition is in terms of objectives. There has never been any generally accepted formulation of the objectives of higher education comparable, for example, to the widely quoted cardinal principles of secondary education. Furthermore, it is entirely probable that if such a formulation were made, it would not differ greatly from a statement of the aims of other types of education. One objective, research, is perhaps a peculiar characteristic of higher education. But, actually, the pursuit of this objective occupies a very small part of the attention and energy of present-day institutions of higher educa-

tion. The degree to which the objectives of higher education overlap with those of the other levels makes definition on this basis of little value.

Another basis for a definition of higher education is found in the description of the methods used in teaching at this level. For example, some would define higher education as that level at which the student begins to work independently. This definition is inaccurate, for independent work is a method widely advocated and striven for in secondary schools. The writer's observation is that this method is not nearly so generally used in colleges as is commonly assumed, and that even at the graduate level the student who can really work independently is very much in the minority. If this definition in terms of method were strictly insisted upon, much of what is now accepted as higher education would have to be designated by some other term. It really appears that there is no single method or group of methods sufficiently distinctive of higher education to be of much value for purposes of definition.

A basis of definition commonly accepted in academic circles relates to the subject-matter of instruction. The college is a place, it is said, where certain subjects, recognized as of collegiate grade, are taught. The determination of just why one subject should be of collegiate grade while another is of secondary grade is, however, entirely arbitrary. Furthermore, identical subjects are taught in the college and in the secondary school—for example, beginning foreign languages and trigonometry. Through the course of time there has been a marked tendency to shift the levels at which subjects are taught. Arithmetic, for example, now an elementary school subject, was originally taught in the college and university. Astronomy, now practically everywhere limited to the college, was widely taught in the secondary schools two or three generations ago. W. J. Osburn, after a careful study of the overlappings of subjects taught in high school and college, concludes that approximately 23 per cent of the history taught in the high school is also taught in substantially the same form in colleges and universities.[1] These considerations show conclusively that a definition of higher education in terms of subject-matter has no universal validity.

A fifth basis of definition which, although not widely used, seems to offer promise, deals with the characteristics of the young people who are the objects of instruction. On this basis higher education may be described as that form of institutionalized instruction suitable for the needs of people of an intellectual maturity corresponding to that of the normal young person who has previously undergone from 10 to 12 years of study. This definition may force the inclusion of some types of instruction not now considered a respectable part of higher education. In such cases the difficulty may be with the currently accepted standards rather than with the definition. The definition has the advantage of a rather universal validity and in addition affords an interesting point of departure for studying the relation of higher education to the social order.

[1] Osburn, W. J. *Overlappings and Omissions in Our Courses of Study.* Public School Publishing Co., Bloomington, Illinois, 1928. p. 52.

The questions may be asked, "Why does society maintain institutions of higher education? What purpose does the social order seek to serve in supporting colleges and universities?" Six widely different points of view may be distinguished in the answers that are currently given to these questions.

The first point of view is that higher education is maintained for the sake of the continuance of the existing institutions engaged in such work. This point of view frequently controls the actions and attitudes of members of boards of trustees and administrative officers of colleges and universities, although it is not often admitted openly or stated explicitly. Some examples of the existence of this point of view may be cited.

In a mid-western state a strong complaint has recently been registered by a group of private institutions against the state-supported universities and teachers colleges because the latter charge very low tuition fees, and an attempt has been made to force the state institutions to charge fees as large as those of private institutions. The only reason for this complaint is that the private colleges find it hard to exist in the face of the competition afforded by the state institutions. The proposal for higher fees is not motivated by any intelligent effort to improve the conditions of higher education as a whole, but only by the desire to make it easier for certain kinds of institutions to survive.

Another evidence of this point of view, that higher education is maintained for the benefit of the existing institutions, is afforded by the unwillingness of colleges to discontinue, even after it becomes apparent that they no longer have any possibility of rendering effective service. In numerous cases carefully made surveys have recommended the discontinuance of institutions. Almost without exception this recommendation is met with a stubborn refusal to face the facts, and the college continues to devote its energy chiefly toward the maintenance of its own meager existence.

A third example of this point of view is afforded by the resistance which newly developing types of institutions have encountered from the established colleges and universities. One does not need to go outside the state of Indiana to find an excellent illustration. In this state the public junior college has not had the development it has had in other states. The inside story of why this state has failed to keep pace with modern educational trends in this particular may be told in a single phrase—the opposition of the established colleges and universities. Instead of welcoming the development of this new and promising type of educational service, existing institutions, fearful of the withdrawal of some of their clientele, have behaved like a bunch of big bullies pouncing upon a self-conscious newcomer in the school yard. As a result the young people of the state of Indiana are probably not today being given the opportunities for higher education at the junior college level that are afforded in many other progressive states.

Many other examples might be cited to show the prevalence of this selfish institutional point of view toward the maintenance of the program of higher education. While this attitude is not often openly expressed,

it has been a powerful undercurrent in controlling the thinking of many educational leaders.

The second attitude sometimes found toward the maintenance of higher institutions is based on the idea that the system is operated for the benefit of faculty members. This viewpoint is not unknown at the levels of secondary and elementary education judging by the pronouncements from some teachers' organizations which reflect the idea that the public school system is operated for the purpose of providing jobs and pleasant working conditions for members of the instructional staff. A well-known organization in the field of higher education apparently is motivated chiefly by this point of view in most of its dealings with matters affecting colleges and universities. In a recent survey of a college for colored students the president was asked why there should be segregated institutions for members of the negro race. He replied that, while he and most of his faculty did not believe in segregation of negroes for educational purposes, yet there must be some institutions in which negroes with the Ph.D. degree would be acceptable as faculty members and would have an opportunity to exercise their talents. It may be estimated that the number of people in the country who believe that institutions of higher education should be maintained merely to give people of scholarly interests convenient and pleasant places in which to do the kind of work they like is relatively small.

A third widely held opinion is that higher education is maintained for the sake of pure learning as such. From this standpoint our accumulation of culture and learning is looked upon as a precious heritage to be transmitted to the oncoming generation untarnished and undiminished, and without any particular regard to whether or not the next generation or any future generation will ever need that knowledge. This point of view has been especially dominant in curriculum construction at the college level; its influence has also operated much lower in the school system, the high school being particularly affected. From this point of view the curriculum is developed by surveying the existing store of knowledge in a given field and arranging and organizing this knowledge in some sequence so that it may be taught. The contents of a course are determined exclusively by the available knowledge in the field, not by the needs of the students who are to study the subject.

A fourth point of view expresses the opinion that higher education is maintained for the benefit of individual students. An example of this viewpoint is found in a stress that was being given a few years ago to the monetary value of an education, a stress that was probably inaccurate and misleading. Another illustration comes from one of the distinguished university presidents of America, who has expressed the opinion that the evolution of higher education in this country has been from an original purpose "of a chartered charity for civic ends to that of a carefully cultivated commodity for individual purposes." This president's gift for alliteration is probably greater than his insight into the true purposes of higher education, for the tax-payers of the state of Indiana would probably not be interested in providing the funds necessary for the support of this university if they were told that its

object is the furnishing of a commodity that is merely of individual benefit to the relatively few citizens of the state who are privileged to enjoy its opportunities.

A fifth viewpoint that can be distinguished postulates that the system of higher education is maintained for the benefit of certain limited social groups. In the days of the rapid expansion of denominational colleges, institutions of that type were widely urged by churchmen for the furtherance of sectarian purposes. Today, however, the majority of denominational colleges disavow any narrow aim of this type. In a few instances one might draw the conclusion that certain state institutions are maintained for the benefit of the predominant political party. Fortunately, such instances are rare although not entirely unknown in America.

Perhaps the most familiar illustration of the attitude, that institutions of higher education are operated for the benefit of a limited group, is reflected in the tendency, becoming especially marked today, to insist that these institutions refrain from any criticism of the dominant economic class. The members of this economic group apparently have no hesitancy in recommending and adopting measures that tend to stifle any movement in colleges and universities which might possibly challenge the supremacy of the class. It seems clear that such people are thinking of higher institutions as instruments to be used for the benefit of their own class. The increases in the fees charged students and the open suggestion that students should pay the full cost of their education are even more subtle indications of the effort to control higher education for the benefit of a limited group in the social order—those with money enough to provide the necessary fees and expenses for their children.

Finally, there is a sixth point of view, the attitude that higher education is maintained for the benefit of society as a whole—not for any limited social group, not for the individual student except as he is a member of the social order itself, not for the sake of pure learning except as learning serves a social purpose, not for the benefit of scholarly inclined people who hold faculty appointments nor for the benefit of the institutions that happen to exist, but for the benefit of the social order as a whole. One can go back to a document written about 150 years ago to find a very clear expression of this ideal. The Northwest Territory Ordinance of 1787 stated: "Religion, morality, and knowledge being necessary to good government and the happiness of mankind, schools and the means of education shall be forever encouraged." This statement has never been improved upon. It is upon the foundation of this principle that the public school system, with its crown of higher education, was established in this part of the country, and the fathers of that day were unequivocal in their avowal of a large social purpose in establishing schools and the means of education.

Although all these different viewpoints that have been recounted actually exist, none except the last is sufficient to explain society's willingness to maintain the vast program of higher education, or to give assurance of the continuation of the program in the future. Each of

the first five of these points of view characterizes higher education as a parasite on society. The last mentioned viewpoint makes the program of higher education an integral and a necessary part of the social order.

Perhaps it would be well to spend a minute on the idea that colleges and universities are social institutions. In this country it is the universal practice to charter or incorporate such institutions. Thus at its very birth the college or university is ushered into existence by the duly constituted agent of the social order. Furthermore, these institutions are supported from public or semi-public funds in the form of taxes or philanthropy. Practically all of them are given the privilege of tax exemption, which actually means a further public subsidy. The means for the support of higher education are thus drawn largely from sources that are social rather than personal. An institution of this type is manifestly of value only as it serves society. It is therefore important that inquiry be made as to what the social order demands of these institutions of higher education. Two of the demands that will be mentioned are of long standing; two are relatively recent in their origin.

Traditionally, society has relied for many centuries on institutions of higher education for the provision of necessary educational facilities for the professions. The first college in this country, Harvard, was explicitly founded to provide training for the ministry. Provisions for other professions have been added during the course of the history of this country until now practically every vocation of the professional type is provided for at the university level, including also the profession of scholarship itself. It must be remembered, from this point of view, that university education for the professions is provided, not because individual students want to become doctors, lawyers, ministers, etc., but because society needs people in the professions who are well trained.

A second service expected from institutions of higher education by the social order is the discovery, conservation, and promulgation of the truth. The social order of the twentieth century seems to realize the necessity of this provision in far larger degree than has ever been in evidence before, and institutions and faculty members today are protected in the pursuit of this objective more satisfactorily than ever before in the world's history. The agitation against academic freedom that has recently been fostered by certain influential agencies has been singularly unsuccessful, a fact that indicates how fundamentally this idea of protecting the pursuit of truth is rooted in our social order. It should be recalled, however, that this protection is given, not for the sake of truth or learning itself, but because society realizes that it needs and must have centers in which truth can be investigated and promulgated fearlessly and without distortion.

In recent times certain new social situations have arisen that impose new demands for services which have not traditionally been a part of the program of higher education. Two of these new demands seem of special importance.

The first arises because living has become extremely complex. The development of communication has made necessary a much broader social understanding than was demanded in simpler times in order that we may get along happily in our enlarged circle of human contacts. Discovery and invention have made the process of living take on new complexities. These circumstances have made necessary a longer period of preparation for effective living, and as a result the period of preparation now laps well over into the age group normally served by institutions of higher education. There is thus brought to the colleges and universities a demand for new types of instruction, some of which deal with subjects that were previously unheard of at the college level. Traditionalists, of course, raise their eyebrows at this demand, and try in every way to stem the incoming tide of these new instructional units. But such opposition is almost certainly doomed to failure, for society has a way of getting what it wants.

A second important situation that has arisen within the social order has come very recently. Economic production has been stepped up rapidly to the place where young people of college age are no longer wanted in productive employment. This seems to be a clear gain, but it entails certain important social readjustments. Particularly, this group of young people that are released from productive employment must be cared for in some manner. They cannot be left to roam the streets, to ride the box cars, and to fill the penitentiaries and prisons. Some form of occupational regimentation is absolutely necessary for them. These young people, it must be recalled, are of the age usually found in institutions of higher education.

What are the implications of these new social situations for institutions of higher education? The first is very clear—arrangements must be made to care for a much larger student body. In practice the effective age of compulsory schooling has been considerably increased. It may take many years for the legal enactment to catch up with the practice, but the effect is here. Young people up to the age of twenty or twenty-two are not needed in the labor market and they must be given some form of regimentation. Society has, in recent generations at least, looked to the schools for the solution of such a problem. Will higher education accept the task with which it is faced?

The first question that will be asked by the academic world concerns the intellectual qualifications of these young people. How many of those not now attending college are capable of doing satisfactory college work? Estimates from such surveys of the intelligence of high school seniors as are available would indicate that the present student population in colleges and universities could probably be doubled without lowering the average intellectual ability of the group of students. Economic handicaps today are undoubtedly a more potent barrier to the privileges of higher education than the lack of intellectual ability. A prospective student of mediocre mental capacity will find some place to go to college if he has plenty of money, but many a student above the average in intelligence is denied further educational opportunities because of economic limitations.

But it may be granted that many of the young people, whom society insists must be cared for, are not of the intellectual caliber to fit in with our present conception of college work. What then must the institutions of higher education do? One answer is to adopt (or perhaps I should say maintain) a snobbish, aristocratic attitude, to insist upon "standards," and to refuse to do the job society says must be done. If this attitude prevails there is only one thing for society to do—turn the job over to some other agency. If that ever happens, society is almost certain to become less and less interested in its institutions of higher education and the support and maintenance of such institutions will become increasingly difficult. May I suggest that some of the difficulties in financing colleges and universities in these times may be due to this very attitude?

The other alternative involves a radical readjustment of our thinking about what constitutes true higher education. Earlier in this paper the point has been made that higher education cannot be adequately defined in terms of subject-matter and that the characteristics of the student afford possibly the best possible basis of definition. From this point of view, it would be relatively easy to introduce reorganizations that will care adequately for the new student group that is likely to be brought into institutions of higher education by the changed conditions in the social order.

Another matter of paramount importance is the financial support that will be necessary for such a widespread program of higher education. Can society afford to send any very large proportion of its youth to college? There are plenty of people today who will answer in the negative, and the declining of income of colleges in recent years seems to many to indicate that we shall never again see the generous support of this service that characterized the decade of the twenties. Let it be remembered, however, that in the very years when institutions of higher education were struggling desperately for enough funds to keep their programs alive, society had no difficulty in finding resources to establish a vast program of CCC camps and to care, in these camps, for the very young people, so far as the age grouping is concerned, that would normally be found in institutions of higher education. Fundamentally the Civilian Conservation Corps is an educational program in the minds of most people who are well acquainted with the organization.

A comparison of the amount of support society was able to find for the CCC camps with that which was provided for the total program of higher education in this country during the same period is interesting. The latest published statistics for the colleges and universities in this country are for 1929-30, in which year the total income of these institutions from all sources for educational purposes was $433,787,512.[2] A conservative estimate places the amount of reduction in annual income at approximately 20 per cent for 1933-34. This would indicate a total income for educational purposes in colleges and universities in 1933-34 of approximately $347,000,000. The total number of students on which this sum was spent was approximately one million. During the first

[2] *Biennial Survey of Education, 1928-30.* U.S. Office of Education, Bulletin No. 20, Washington, D.C., 1931. Vol. II, Chapter iv, pp. 52-3.

year of its existence, from April 5, 1933, to March 31, 1934, the Civilian Conservation Corps spent $296,127,000;[3] this is 85 per cent of the estimated amount of income for all the colleges and universities in the country during the academic year 1933-34. The CCC camps enrolled approximately 300,000 men, less than one-third as many persons as were being cared for in higher institutions.

In other words, in the very year when funds for the support of higher education were being supplied so niggardly and reluctantly, society undertook a *new* program to care for a group of young people of college age, and society provided for the support of this new program almost as much money as the total being spent on higher education. Society was willing, furthermore, to provide that program at a cost per person cared for that is almost three times the average cost of providing a year of collegiate work. Educational leaders are blind if they do not see a most significant "handwriting on the wall" in the establishment of the Civilian Conservation Corps and the evident willingness of society to support this new venture.

From a practical point of view society has found that education is one of the cheapest forms of regimentation. The answer to the question, can society afford universal higher education, is that society cannot afford to fail to provide such facilities if it hopes to continue the existence of the present civilization.

What are the prospects of a readjustment to these new social conditions by institutions of higher education? In the past these institutions have made many such readjustments, some of them equally radical and just as disturbing as those that seem to be implied in the present situation. For example, about one hundred years ago people began to want to study a new subject, science, which was not considered a respectable subject of study at the college level by the academicians of that time. The demand for instruction in science was met by a stubborn refusal on the part of the guardians of existing culture. Read the Arnold-Huxley debates for a review of the arguments that were used. Society in general, however, recognizing that it wanted and needed to have science taught, and being confronted by the stubborn refusal of its existing institutions of higher education to render this service, would not be balked. What happened? In 1862, after some preliminary efforts, the Congress of the United States passed the so-called Morrill Act, providing federal funds for the establishment of a new type of higher institution, which was to be devoted chiefly to the teaching of agriculture and the mechanic arts and the applications of science. These efforts forced the hands of the existing institutions and soon, more or less reluctantly, they began to offer the instruction in science that society was demanding. Today instruction in these fields is everywhere recognized as on a par with the academic subjects which have been taught in colleges for a hundred years.

Another example of a readjustment of higher education under social pressure may be cited from somewhat more recent times. Society some years ago began to demand better trained teachers for its public

[3] *Second Report of the Director of Emergency Conservation Work*, March 31, 1934. (Mimeographed.)

schools. Existing institutions of higher education were in many cases loath to introduce professional preparation for teaching into their sacrosanct curriculums. The echoes of this struggle have not yet died down, but most colleges and universities have modified their programs in accordance with this new demand of society. These examples of previous reorganizations are hopeful signs of the possibility of readjustments in present-day institutions.

Considerable hope may also be drawn from the experience of the secondary school, which somewhat earlier began to meet this very same demand for readjustment that is now facing the college. Two generations ago the aristocratic idea of secondary education began to break down in response to a demand for wider opportunities for education at this level. The secondary school responded to this demand, modified its outlook, and developed a flexible program to serve the society by which it was maintained. Today the American high school is perhaps the greatest achievement ever attained in a democracy, and is an outstanding example of an extraordinarily fine adjustment made by an institution to the demands of its social order. The adjustment in the high school was not made without a struggle, and many earnest leaders had to reorganize their thinking considerably to bring it about; but it is here today as a monument to the wisdom of this leadership and as an outstanding example of a highly serviceable social institution.

There are some signs of attempts at readjustment in higher institutions today that are very encouraging. Three examples may perhaps be mentioned specifically. The first is the rapid development of the junior college, and the evidence, that now seems conclusive, of the educational effectiveness of this unit.

The second is the development at the University of Minnesota, where a new type of college has been introduced. In its General College the University of Minnesota offers a curriculum that will meet the needs of students whose interests are non-specialized along academic lines.

The third interesting development is the new standardizing procedure of the North Central Association which is based upon the theory that an institution should be judged in terms of its own aims and objectives and in terms of the service that it renders to its constituency. No longer is it fatal for an institution to declare that its purpose is to minister to a group of students who are not highly selected for intellectual ability. Colleges are now encouraged to arrange their programs in the light of the best available service to their own constituency, rather than in terms of some predetermined pattern.

On the whole, optimism regarding the future of higher education seems warranted. If existing institutions have become inflexible and prove to be unable to meet the demands for readjustment, they are unquestionably doomed to ultimate extinction. Nature's command to social institutions, just as to biological organisms, is: "Readjust to changing environments, or die." There are many signs today that the necessary readjustments demanded by the social order will be forthcoming in our American system of higher education, and that society will continue to foster and support these institutions and to look to them for an important social service.

Values Transcending Evaluation

JESSE H. WHITE, Former Professor of Psychology, University of Pittsburgh, and Former President of James Millikin University

NO ONE needs to speak now in defense of measurement work. The significance of establishing acceptable units of measure, of accurately applying those units of measure to the things to be measured in the field involved, and of interpreting the results with exactness and showing how they may be used directly or indirectly in improving the conditions of daily living—these steps constitute a method of procedure in scientific investigation approved by all trained minds today.

So those who have charge of planning and calling this annual conference on educational measurements are to be commended in bringing together educators from over the state not so much to strengthen the reasons for measurements but rather to work out together the maturest judgments possible on what to measure, how to measure, what the results mean, how the results may be applied in refining the details of human everyday activities, and how all of these steps, together with the results, broaden and deepen our perspective of life and environment as they really are.

When I was asked to take a place on this program, it occurred to me that perhaps I could best do my part by supplementing the work of the other speakers in calling attention to the very important fact that in each field there are things that as yet cannot be measured. And the peculiar paradox of it is that the things that we speak of in this and that field of study as not being subject to measurement, so far as we know now, are not infrequently the most significant things in those fields.

For example, medicine is one of the oldest fields of scientific investigation, involving throughout its history the most important findings in each of the many sciences involved in medicine. For that reason medicine has the continuous opportunity of making use of the research procedures used in these many sciences; and, all through its long history, medical practice has run directly parallel with the findings of research and experience. Yet, today, medical investigators and practitioners tell us they cannot measure what they and we would consider to be the prime issue in any case of illness—they cannot measure the development of a disease. This means that they cannot measure the cause of the illness—nor can they measure the way that cause is operating or is going to operate in any particular case. Stating it simply, the physician has to follow the symptoms; he cannot travel ahead of them and make ready to battle with them when they arrive. In treating any case of illness, the physician's method is mainly that of following after and trying to deal with the causes from behind.

This is not speaking uncomplimentarily of the physician or of the medical science. It is merely an acknowledgment of plain fact. To our inquiry, the doctor responds with the statement that no two cases of pneumonia are alike; that in illnesses one can never tell what is ahead; and that, whereas the general trend of each of the best understood diseases is known, the incommensurable personal equation and other unexpected interferences enter to bring surprises in complications and outcomes. When the doctor answers us in this way, he is stating the facts in terms of everyday conversation. Were I to state those same facts in terms of my discussion this morning, I would say that in the field of medicine the most expert in research and in practice recognize and grant that here is something in their own field about which they would like to know and be able to speak more or less definitely but, since they cannot measure this thing, they cannot safely predict regarding it.

Whatever your field of study is, and whatever mine, we have to grant that there are things in each of our fields that, so far as we now know, cannot be measured. The chemist, the physicist, the biologist, the geologist, the physiologist, the astronomer, and all the rest would have no difficulty whatever in naming things in their respective fields that cannot be measured. Certainly those of us who work in one or another of the different fields of education or psychology could list numerous things in each of our fields that, at present at least, are not subject to measurement.

These incommensurable issues are the ones I have in mind when I speak of values that transcend evaluation.

For a very definite and significant case in point in discussing values transcending evaluation, I turn now to my own field of special interest and investigation—the field of personality problems. This is a field of study that has interested every educator and every parent for many centuries. It is a field that falls within the scope of this conference.

From the days of Plato and Aristotle to the present time, much has been written and spoken with reference to personality. Because of the interest the masses of people have taken in the subject of personality and its variations, the field has been a very fruitful one for popular writers—writers who in a very large majority of instances were entirely without authority to write or speak on the subject. Some seventy years ago, fakers and pseudo-workers of varied descriptions entered the field and filled the common mind with seriously erroneous notions which had no factual foundation whatever. This unfortunately prevented well-trained, scientifically-minded men from entering this very fertile and virgin field until the actual demand for authoritative data relative to personality resulted in causing a small number of able investigators to take up scientific study in this field.

As they entered, they found a very fascinating and important field in which to work. But at the very start they met with many difficulties, some of which seemed insurmountable. They found practically nothing in the way of an attempt to measure. This lack of measurements explained why nothing substantial had been accomplished in this rich

field of study. These men faced also the difficulty of going into a field of investigation which as yet had no scientifically defined terms; and not only were there no acceptable methods or even principles of procedure, but the precedents, unfortunately, were wrong and very misleading. These investigators, well equipped by training and experience, were of such dispositions that they would not be downed by such difficulties. Rather, they looked upon them as a challenge and they accepted the challenge. Because of their work, and the work of those who have succeeded them, considerable advances have been made in definition, in method including measuring, and in understanding.

[At this point, the speaker stopped the formal presentation of his paper to speak informally of the work that has already been accomplished by the investigators in this field in the way of setting up standards for the defining of terms, of devising worthy methods of procedure and preparing a critique for the calibrating of measurements for this special type of work, of working out a technique for classification of personality traits and qualities, and of designing productive devices for interpreting findings. The speaker called attention to the handicaps that investigators in this field are inevitably subject to and the pitfalls continually present because of the limitations that are inherent in the method it has been necessary to use. He then emphasized the significance of realizing that the elements of personality that have been subjected to rigorous investigation are, after all, only the apparent ones and do not by any means represent more than a part of the whole personality; that there are other elements that constitute the very core of the personality and are, therefore, a much more fundamental and substantial portion of the personality. The apparent or surface elements of personality were then compared with the more fundamental elements on the basis of a number of different criteria. This was done for the purpose of showing that, while the surface traits are more or less temporary adjustment devices by which the individual tries to deal with his immediate changing environment, the fundamental elements of personality result rather generally from intelligent choice. While these traits function in making more general adjustments to significant changes in the environment, only occasionally are they seen at work in the foreground of the individual's activities. Instead, they constitute the comparatively stable and permanent background of what the individual's substantial personality really is—the factors that will determine what the individual stands for through every kind of situation, hard and easy. Throughout this informal part of his discussion, the speaker made frequent uses of blackboard diagrams and graphs.]

With these informally stated facts before us, we may readily see that here is a very definite and significant case in point in our discussion of values that transcend evaluation.

A personality has two sets of elements: the apparent or surface elements and the ones that are central and more fundamental.

Much effective work has been done in the study of certain of the surface personal traits. Various methods, including measuring, have been used. No one should doubt that definite gains have been made

from such investigations. Groups of facts are now known regarding certain single traits as they appear in different individuals. Not a little has been done in interpreting the interrelations between and among certain of these surface elements and the ways in which those interrelations operate in behavior. It has been established that some of the surface traits may be more intimately related than others with some of the fundamental traits and that there are variations in these interconnections from person to person. Attempts have been made to explain why this is so. Such attempts are very worthy and no persons in the field of education should fail to appreciate them or in any way try to discredit the results of such study. Instead, they should encourage all sincere efforts in this direction, hoping that others of these surface traits will be taken up and subjected to the same care in measuring and understanding.

An individual's surface traits are used as means of making adjustments to the immediate situations of his changing environment. They are the traits that others immediately see and use in passing judgment on that person. These same surface traits are those, whether they are the right ones or the wrong, which are copied by others. Parents and teachers know very well that all too frequently, especially with younger children, the traits that are copied are the unfortunate ones.

At the same time, we must not overlook the very decided limitations under which we are working as we study the surface personal traits. We must not forget that the surface personal traits are but a minor part of the personality. Carry the measuring and interpreting of these single surface traits as far as we will, but we shall never be able, on such results alone, to arrive at any general laws with regard to how the personality develops or how it behaves. Nor can we ever hope, on such a limited set of facts, to be able to predict the tomorrow for any personality. Certainly no one should have difficulty in seeing how futile would be any attempt to classify individuals into types on the basis of their surface traits.

Let me say again that, for reasons mentioned in an earlier paragraph, the surface personal traits are very important although they constitute but a minor part of the whole personality.

When we turn to the fundamental elements of personality, the entire story may be told very definitely and very quickly. It is this. While the fundamental elements, consisting of one's standards, ideals, and the like, are by far the major part of his personality—in fact, the most significant thing in his entire mental make-up—we have to say that we cannot measure these fundamental elements. So far as we know now, we have no way of setting up units of measure and applying them to these substantial parts of his personality. These elements are values that transcend evaluation.

What can be done in further advancing the study of personality problems?

We should continue to use every available means of measuring and studying the surface personal traits, gathering more facts regarding the ones that have already received considerable attention, and under-

taking the investigation of others. It is believed that further gains will be made in interpreting the interrelations among the many surface traits as well as the interconnections that are believed to exist between certain of the surface traits and some of the fundamental ones. It is possible that such additional understandings may reveal some significant truths concerning the fundamental elements of personality.

With regard to the incommensurable fundamental elements of personality, I shall say that we have done much when we have succeeded in separating out the parts of the personality that we cannot measure. To have established beyond question the relative importance of the surface personal traits and the fundamental ones is another achievement in which we should take just pride. To have discovered that the fundamental elements of personality are the more general adjustment bases is very encouraging and suggests the need of developing a fuller appreciation of the fundamental traits, some definite educational adjustments to care for them, and the use of the most productive method of procedure for their further study.

It is clear now that the use of laboratory experiments and measurements in the study of the fundamental traits is extremely limited. The method that offers greatest promise in their further investigation is that of refining our powers and procedures in scientific observation.

[On completing the reading of the paper, the speaker summarized briefly some practical educational corollaries that may be reached from the facts of the paper.]

Measuring the Excellence of Institutions of Higher Education

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TO MANY thoughtful people the idea of measuring the degree of excellence attained by a college or university seems both futile and sacrilegious. The true inner spirit of an institution of higher education, they would say, is so immaterial that any attempt to measure its excellence would be like trying to weigh the imponderable. Such opinions may be dismissed with little attention, for unheeded and unnecessary objections of this type lie thickly strewn along the path of scientific development in practically every field. Electricity, for example, was for a long time believed such an ethereal substance as to be unsusceptible of measurement; yet today the public utility company has no difficulty in determining the amount of our monthly bill for current, even though scientists are still far from certain concerning the nature of the stuff we are paying for.

On numerous occasions it becomes necessary to pass judgment concerning the relative excellence of an institution of higher education. Whenever a student decides what institution to attend he must make some evaluation of the relative services afforded by various colleges and universities. The transfer of a student from one college to another necessitates an evaluation of his credits, and some basis must be accepted for recognizing the quality of the work done in the former institution. The employment of a teacher, if done on a professional basis, involves some evaluation of the quality of the applicant's preparation and of the standing of the institution in which the necessary training has been taken.

In practice these judgments of institutions are, it is true, often made unwisely and without full knowledge of the facts. Nevertheless, the judgments *are made*. The fact that excellence is an intangible, spiritual trait should not inhibit an attempt to develop a means of measuring it better than the inaccurate evaluations which have hitherto characterized our thinking. It was to assist in the formulation of more accurate judgments regarding the quality of institutions that the so-called standardizing agencies were established.

Up to the closing years of the nineteenth century no standard definitions had been formulated of what constituted a college or university. As a result there were many establishments that purported to do college work and granted academic degrees which would by no means be recognized as institutions of higher learning. When student enrollments began to increase and when inter-institutional relationships began to become important, this lack of definition became serious. Thereupon

groups of institutions began to organize into associations, and to agree upon standards to define work of college grade. Such agencies as the North Central Association of Colleges and Secondary Schools and the Southern Association of Colleges and Secondary Schools had their origins in the attempt to meet this situation.

The standards that were at first set up in defining a college were determined wholly on the basis of authoritative opinion. Dr. Charles H. Judd at the last annual meeting of the North Central Association recounted at some length the difficulty that the Association faced in setting up its first definition of a college and in applying this set of standards to the existing institutions. In justice to those pioneer efforts it must be recalled that the task was done in the days when the science of education was in the early stages of its development, before the time when scientific techniques were generally available for the solution of educational problems at the collegiate level. The standards that were so evolved, however, were reasonably workable and their introduction has had a profound effect on the existing institutions. Financial support has been sought and obtained in amounts previously undreamed of. The qualifications of faculties have been greatly improved, and conditions of teaching service have been bettered. The libraries have been strengthened, and in many phases of institutional activities, for example athletics, a badly needed house cleaning has taken place. Although it is perhaps too much to attribute all of these improvements to the accrediting agencies, the American college has unquestionably benefited greatly by the establishment of such organizations.

Although the operation of the accrediting process was generally recognized as productive of great good to the program of higher education in this country, certain criticisms began to be raised. Some critics said that the imposition of standards was tending to develop a cramping uniformity that was blocking educational progress. Others said that the standards were mechanical and measured only external features, not the true spirit of the institution. It was pointed out by other critics that the inspectional process was largely subjective and therefore presumably unreliable. The standards that were promulgated were only minimal, and this feature of the accrediting process was criticized because many institutions tended to be satisfied with merely the minimum of achievement necessary for membership in one of the accrediting associations. Finally, a number of carefully controlled studies indicated that many of the existing standards, when subjected to the test of rigorous investigation, did not have the validity they had been thought to possess.

The meetings of the North Central Association provided a forum where these criticisms received careful attention. The Association itself finally appointed a committee to deal with the problem of revision of standards, and funds were sought and obtained for a painstaking study of the entire question. The Committee of Revision of Standards entrusted the actual conduct of the investigation to a small research staff, the Committee itself retaining general supervision over the work. The general plan of the investigation, which was begun in 1931, was to visit a considerable number of representative institutions in order to collect

as much data as possible on a strictly comparable basis. The plans then called for a careful sifting of this information to determine which items might be of value in judging the excellence of institutions and their eligibility for accreditation.

Almost four years have been spent in the work of the investigation, during which 57 representative institutions have been visited. The institutions on which the study was based included a wide variety of types, such as liberal arts colleges, universities, junior colleges, teachers colleges, and Catholic colleges. They ranged in enrollment from a very small junior college up to some of the largest universities in the area. By every test that was later made the group of 57 proved to be a representative sample of higher institutions in the North Central area.

The data collected from these institutions were very extensive. In collecting the information specially prepared forms or schedules were used which were, for the most part, personally administered in each of the institutions by representatives of the research staff. The extensiveness of the information collected may be illustrated by the fact that in the field of administration alone a total of more than 1,100 factual items were obtained from each institution. The analyses in the other areas of the investigation, pertaining to the faculty, curriculum, student personnel service, library, finance, physical plant, etc., were equally exhaustive. Each member of the investigating staff was assigned definite aspects of the institutions for special study; the writer concerned himself chiefly with administration, finance, and physical plant.

After collecting the information, preliminary analyses were made of the returns. These analyses revealed a number of items on which the information was unreliable or on which it had proved to be difficult to obtain the required data. When these items were not particularly important, they were eliminated from further consideration. The remaining items were then tested carefully for their ability to discriminate institutional excellence. This process of evaluation will be described at some length.

In order to determine whether or not a given fact is useful in discriminating excellence, it is first necessary to have one or more independent criteria of excellence to be used as measures against which the item can be tested. To be satisfactory the criterion used must be reasonably independent of the data that are to be tested. In the study of standards it proved possible to set up a number of such criteria.

One of the criteria was constructed by having each investigator who had visited the institutions in the study set down a ranking based on his own subjective impression of the excellence of the institution. By this process each of the three groups of investigators produced an independent ranking of the institutions, rating the one considered best as number 1, rating the poorest as number 57, and giving intermediate values to all the others. These rankings were all made without reference to the data that had been collected, and reflected the total impression made by the institution on the investigators. A composite of the three sets of rankings furnished a criterion which has been labeled "subjective rating of general excellence." This procedure possibly sounds very un-

TABLE I. INTERCORRELATIONS OF CERTAIN CRITERIA OF EXCELLENCE USED IN THE NORTH CENTRAL ASSOCIATION STUDY

Criterion	Subjective rating by investigator A	Subjective rating by investigator B	Subjective rating by investigator C	Composite of subjective ratings by investigators	Total scores on administration	Total scores on personnel service	Rating given faculty	Composite rating including results of tests
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. Subjective rating by investigator A	.....	+.90±.02	+.86±.02	+.94±.01	+.84±.03	+.78±.04	+.74±.04	+.72±.04
2. Subjective rating by investigator B	+.90±.02	.....	+.88±.02	+.96±.01	+.80±.03	+.92±.01	+.68±.05	+.75±.04
3. Subjective rating by investigator C	+.86±.02	+.88±.02	.....	+.96±.01	+.82±.03	+.76±.04	+.59±.06	+.80±.03
4. Composite of subjective ratings by investigators	+.94±.01	+.96±.01	+.96±.01	.....	+.86±.02	+.83±.03	+.76±.04	+.77±.04
5. Total scores on administion	+.84±.03	+.80±.03	+.82±.03	+.86±.02	.....	+.72±.04	+.72±.04	+.64±.05
6. Total scores on personnel service	+.78±.04	+.92±.01	+.76±.04	+.83±.03	+.72±.04	.....	+.58±.06	+.67±.05
7. Rating given faculty	+.74±.04	+.68±.05	+.59±.06	+.76±.04	+.72±.04	+.58±.06	.....	+.59±.06
8. Composite rating including results of tests	+.72±.04	+.75±.04	+.80±.03	+.77±.04	+.64±.05	+.67±.05	+.59±.06	.....

scientific; as a matter of fact the agreement between the ratings of the three groups of investigators, each of whom had looked at entirely different phases of the institution, was remarkable. By every test that could be applied this criterion proved to be a highly reliable indication of the general excellence of the institution. Independent tests with this method of providing a general ranking of institutions indicate clearly that it is a much more reliable method than would at first appear.

But sole reliance was not placed on this one criterion. Another was constructed by making an elaborate evaluation of the teaching staff; this criterion was known as the "rating given faculty." A similar analysis was made of the administrative organization, and the total rating on administration became an important criterion for use in certain parts of the study. One of the investigators devoted his special attention to the problem of student personnel service, and his rating on the effectiveness of that service provided a valuable criterion. An elaborate testing program was carried on in the institutions and the results of the achievement tests could be combined into a composite total and used as a criterion. This criterion proved to have certain defects which cannot be enumerated here, but it was nevertheless a valuable instrument in many parts of the study.

A most significant fact about these criteria is their agreement. Table I shows the intercorrelations of each of the criteria with every other and also the correlations of the individual subjective rankings with each other and with the composite of the subjective rankings.

It must be recalled that each of these criteria was developed in complete independence from each of the others. The order of agreement revealed by the coefficients of correlation is about as high as is usually found in any educational data, lending confidence to the further use of the measures as valid criteria of institutional excellence.

Three different methods were used in applying the criteria to specific items by way of determining the value of the items in the accrediting procedure. The first method was that of correlation. This process could be used when an item afforded a distribution of scores or values; the coefficient of correlation then would indicate whether or not there was a tendency for a high score on the item to be associated with a high rank on the criterion and a low score on the item to be associated with a low rank on the criterion. Table II presents data from a section of the study dealing with finance to illustrate the use of the correlational method of dealing with items.

The data of this table bear on the question whether or not weighted income per student is a good index of institutional excellence, and whether or not income from particular sources should be included or omitted in considering the item. The weighting that is applied to income concerns the size of enrollment and need not be discussed at this point, inasmuch as the table is introduced merely for the purpose of illustrating the use of the correlational technique.

It will be observed from the table that the correlations between income per student and each of the criteria of excellence are relatively high, whenever income from students is included in the calculations.

TABLE II. CORRELATIONS BETWEEN CRITERIA OF EXCELLENCE AND VARIOUS MEASURES PERTAINING TO THE STABILITY OF INSTITUTIONAL FINANCING

Measure of stable income	Type of institutions	Number of institutions	Coefficient of correlation between measure of stable income and criterion of excellence				
			Subjective rating of general excellence	Rating given faculty	Composite rating including results of tests	Rating given student personnel service	Rating given administration
1. Weighted income per student from all stable sources, including student fees.	Public and private combined	44	+.74±.05	+.63±.06	+.60±.07	+.63±.06	+.67±.06
2. Weighted income per student from all stable sources except student fees....	Public and private combined	44	+.49±.08	+.35±.09	+.39±.09	+.36±.09	+.48±.08
3. Weighted income per student from all stable sources, including student fees.	Private	30	+.76±.05	+.65±.07	+.58±.08	+.70±.06	+.69±.07
4. Weighted income per student from all stable sources except student fees....	Private	30	+.55±.09	+.43±.10	+.43±.10	+.49±.09	+.48±.09
5. Weighted income per student from student fees.....	Private	30	+.82±.04	+.79±.05	+.62±.08	+.79±.05	+.79±.05
6. Weighted income per student from endowment.....	Private	30	+.61±.08	+.53±.09	+.51±.09	+.54±.09	+.56±.08
7. Weighted income per student from continuing gifts and grants.....	Private	30	−.19±.12	−.33±.11	−.27±.11	−.16±.12	−.25±.12

This indicates that information concerning the amount of weighted income per student from all stable sources would be of value in estimating the relative excellence of a number of institutions. The correlations are much higher when income from student fees is included than when such income is omitted. (Compare item 1 in the table with item 2; also item 3 with item 4.) This fact clearly points to the conclusion that income from student fees has an important association with excellence. Note that the correlations with the criteria are higher for income from student fees than for income from endowment. This finding is exactly the opposite of the opinion that is represented by the former standards of the North Central Association which distinctly favored the building up of income from endowment and discriminated against income from student fees. Partly on the basis of findings such as these the new accrediting procedure treats income from students as being of equal value with income from endowment in demonstrating financial stability and as

TABLE III. AVERAGE PERCENTILE STATUS ON VARIOUS CRITERIA FOR GROUPS OF INSTITUTIONS CLASSIFIED ACCORDING TO ALLOCATION OF AUTHORITY FOR CONTROL OF SEVERAL DETAILS OF CURRICULUM CONSTRUCTION

Details of curriculum construction:	Number of institutions	Average percentile status on: Subjective rating of general excellence	Rating given administration	Rating given faculty
Constructing and revising curriculum:				
in hands of faculty	46	58.8	60.2	57.8
not in hands of faculty	11	17.5	11.8	18.0
Determining required courses for certificates and degrees:				
in hands of faculty	42	60.8	61.6	60.8
not in hands of faculty	15	22.2	18.0	20.4
Determining requirements for department majors and minors:				
in hands of faculty	40	54.6	54.1	50.6
not in hands of faculty	17	39.4	37.5	48.6
Decision as to degrees to be offered:				
in hands of faculty	37	58.4	57.4	59.2
not in hands of faculty	20	34.8	33.6	32.4
Decision as to requirements for a degree:				
in hands of faculty	44	59.0	59.4	58.8
not in hands of faculty	13	22.0	18.3	20.8
Establishing field of study within a department:				
in hands of faculty	27	65.0	62.9	62.1
not in hands of faculty	30	36.5	36.0	38.8

being an index of institutional excellence.[1] This table presents many relationships that might be interesting points for discussion, but, inasmuch as the purpose in this paper is only to illustrate the technique of the research, time must not be spent in reviewing the findings as such.

Another method of using the criteria was to obtain the average status on a criterion for groups of institutions classified according to the presence or absence of conditions usually thought desirable. Table III illustrates the use of this technique in the case of a number of items concerned with academic administration.

This method was especially useful in cases in which the classification yielded only a dichotomy, and thus did not permit the calculation of the Pearson product-moment coefficient of correlation. Thus in Table III institutions are classified according to whether they do or do not have a certain condition in their academic administration with reference to faculty control of the curriculum. From this tabulation it is possible to conclude that the institutions which place these matters of curriculum control in the hands of the faculty generally tend to be those with a status on the criterion above the median (50th percentile), while those that do not place the control of the item with the faculty generally tend to fall below the median on each criterion. This fact gives an idea of the extent to which a given condition is usually present in the better institutions (better, according to the criteria) and absent in the poorer ones, and from such data it is possible to determine the relative effectiveness of the item for judging the excellence of institutions.

The third method of using the criteria was to assign numerical scores for given conditions and to calculate the average scores for groups of institutions classified according to status on the criteria. In the section of the study pertaining to administrative organization a score-card technique proved especially valuable. By assigning score-values for various conditions it was possible to compute an average score on a particular phase of the administrative service for any given group of institutions. If the institutions were first classified into the upper, middle, and lower third on the basis of status on a criterion, it could be seen whether or not the better institutions tended on the average to receive higher scores than the poorer institutions received. Table IV presents an illustration of such a use of the data; it deals with the scores on various items concerned with academic administration and with a grouping of institutions based upon the criterion, subjective rating of general excellence.

Table IV shows that on practically all the items in this score card the institutions in the upper third of the distribution on the criterion receive higher average scores than the institutions in the lower third. This is a general indication of the value of the items and of the score card as a whole in judging the general excellence of institutions.

The discussion thus far has emphasized the statistical processes by which items were validated. It must not be thought that the statistical

[1] This finding does not deal with the question of the social implications of dependence on student fees as a source of support. The conclusion goes no farther than the mere fact that good institutions today get more income from student fees than weak institutions get from this source.

TABLE IV. RELATIVE SCORES ON ITEMS OF SCORE CARD III, "ACADEMIC ADMINISTRATION," FOR GROUPS OF INSTITUTIONS CLASSIFIED ACCORDING TO THE CRITERION BASED ON SUBJECTIVE RATING OF GENERAL EXCELLENCE

Item on score card	Perfect score	Average percentage of perfect score obtained by institutions in each third of the distribution on basis of the criterion		
		Highest third	Middle third	Lowest third
A. Curriculum administration	250	66.3	62.4	36.3
1. Authority for control of curriculum construction	150	82.3	81.4	43.7
2. Aims of the institution	50	55.8	47.4	36.8
3. Departmental aims	50	28.6	20.6	13.5
B. Administration of faculty personnel	600	65.5	55.7	47.5
1. Procedure in selection of faculty members	100	75.4	66.1	41.7
a. Responsibility of department head	20	80.0	47.4	31.6
b. Sources of initial suggestions of candidates	40	89.5	86.9	63.2
c. Visit to institution by candidates	40	59.0	54.7	25.3
2. Procedure in appointment of faculty members	100	75.3	64.4	68.6
3. Procedure in promotion of faculty members	100	63.0	64.4	55.2
4. Administrative provisions regarding salaries of faculty	100	73.6	62.2	57.0
a. Practice in making salary changes	40	54.0	43.4	22.4
b. Flexibility of salary scale	60	86.7	74.7	80.0
5. Plan for life insurance and retirement of faculty	100	36.6	16.5	6.2
a. Life insurance plan	25	22.1	14.5	8.6
b. Retirement plan	50	39.8	12.6	5.5
c. Promptness of retirement	25	44.6	26.3	5.3
6. System of sabbatical leaves	50	38.6	20.8	17.8
7. Maintenance of data regarding faculty personnel	50	100.0	100.0	94.7
C. Administrative measures for improvement of instruction	150	64.2	57.2	47.4
TOTAL SCORE	1000	65.5	57.6	44.7

results were the sole basis for validating the items. Each item was tested against the results of previous studies where these were available, and against the general consensus of opinion expressed by those who have studied or written on the matter. In some cases the statistical results are inconclusive, or even in slight opposition to the principles of administrative practice that have long been accepted. In a few such

cases the item was simply dropped from further consideration; in case the item was deemed important, the procedure did not hesitate to follow the results of logical thought and sound experience, even without the additional support of the statistical results.

It should also be pointed out that in this statistical treatment nothing can be inferred as to a causal relationship between status on an item and excellence. That is, the correlations shown in Table II do not prove that an institution is better *because* of larger income any more than they indicate that institutions obtain large income because they are good institutions. In fact, it might be argued that the accrediting procedure itself is not directly concerned with causal relationship. Each of the items in the accrediting procedure is merely an index, not a cause, of excellence; as long as the items retain their relation to excellence, they are valid as indexes, even though they may not be demonstrably causal. A physician uses the temperature of his patient as an index of physical condition. The temperature reading in itself is usually not a causal factor in the illness, but the information is useful to the physician because temperature is associated with more or less definitely known stages of a disease.

Although the statistical processes are in no way dependent on causal relationship, the other process by which items were tested does make some attempt at including those that have a logically causal association with excellence. For example, the quality of the educational program that may be maintained is very logically related to the amount of income available for its support. The accrediting procedure as finally adopted therefore represents a combination of items, some of which are in all probability causally associated with excellence and some of which may not be so associated.

A useful analogy for the selection of items in the new accrediting procedure may be obtained from the field of the measurement of intelligence. When mental tests were first developed, investigators attempted to find reaction situations which would correlate closely with intelligence; but it was necessary first to establish a criterion of intelligence. Terman and other investigators solved this problem by asking teachers to rate their pupils on the basis of a subjective judgment of intelligence. Test items were then studied in an effort to find those to which pupils who were intelligent, according to the subjective judgment of the teachers, could respond, and to which the unintelligent pupils could not respond. When such an item, for example, ability to recall a series of digits, was found, it then became an accepted part of the test. No causal relationship is necessarily assumed in this connection, but the test items merely serve as an index of intelligence.

The discussion thus far has dealt almost exclusively with the technique used in evaluating the items that were susceptible of statistical treatment. Many of the other features of the new accrediting procedure, as promulgated in the published *Statement of Policy*, were developed on the basis of theory rather than by objective measurement. For example, the new procedure is based on the revolutionary principle that institutions ought to be evaluated in terms of their own aims and ob-

jectives rather than by some fixed standard or pattern. Every encouragement is given in the new procedure to the development of individuality in institutions, and the interpretation of findings concerning any phase of an institution is always subject to control by reference to its aims and objectives.

A word should perhaps be said concerning the manner in which the arrays of data collected about an institution may be presented. The findings in respect to any phase of an institution's activities, when reduced to a numerical score, may be translated into a percentile ranking of the institution within a representative group. Figure 1 presents a curve of the percentile distribution of scores made on academic administration by the 57 institutions included in the North Central Association study.

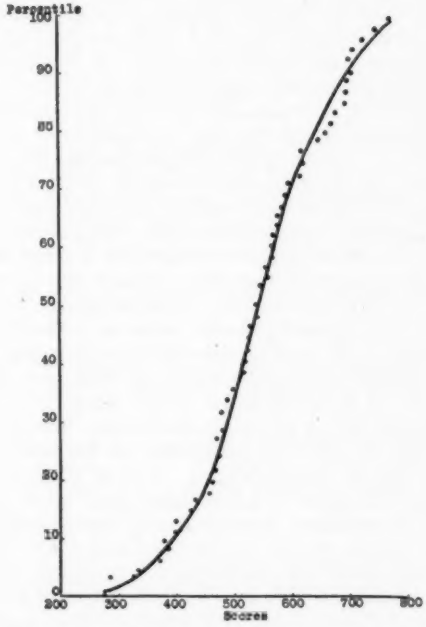


Fig. 1. Percentile distribution of total scores on "Academic Administration."

From this curve it is possible to read off the percentile status of an institution on this item when its score on academic administration is known. For example, a score of 410 points out of a possible 1,000 places the institution in the lowest 10 per cent; a score of 557 points is necessary to reach the median status of the group; a score of 715 points places the institution in the highest 10 per cent.

Altogether about 80 different characteristics, similar to academic administration, are included in the new accrediting procedure. By arranging these items as a series of columns and computing the percentile status of an institution on each item, it is possible to graph its profile, or pattern, and to obtain a ready idea of the point at which the institution exhibits strength or weakness. This device of the pattern map is an important part of the method of portraying the status of institutions on the new accrediting procedure.

The new procedure was adopted by the North Central Association at its last annual meeting. This winter institutions newly applying for membership and some of those that were subject to review for various reasons have been analyzed by means of the new accrediting procedure. It has been my good fortune to assist in a number of these surveys, so that I am able to testify with first-hand knowledge as to what the procedure has done for a number of colleges. Possibly I am biased by my own connection with the investigation, but my judgment is that the procedure has proved remarkably successful. It has fully realized the fondest hopes of its sponsors in the stimulation afforded within institutions. As an inspector, I can say that the process gives one a knowledge of an institution upon which to base a judgment or recommendation which is far superior to the insight obtained under the old accrediting procedure. There are possibly some points on which the new procedure will need revision, but in its main outline I am firmly convinced that the plan is essentially sound and operates very satisfactorily.

The North Central Association is planning a series of publications in which the new accrediting procedure is described. There has already been published a brief *Statement of Policy* in which the general principles underlying the procedure are explained. The Association has issued in mimeographed form a "Manual" in which are set forth the details of the accrediting procedure and in which the conditions that will be looked for in institutions are briefly described.[2] There is now in process of preparation a series of monographs that will present full details concerning the research procedures on the basis of which the new accrediting process was developed. Two of these monographs are about ready for publication and it is hoped that all seven or eight of them will be in print before the end of the current year.

The project of the North Central Association for the revision of standards has attracted wide attention. A group of secondary-school people are now actively at work for the development of a similar project to revise the plans of accrediting high schools. Other regional accrediting associations have displayed a great deal of interest in the outcome of the investigation, and there is some promise of a general adoption of the principles that have been developed by the North Central Association, when their effectiveness in practice is demonstrated.

[2] The *Statement of Policy* and the "Manual" may be obtained from the Office of the Secretary of the Commission on Higher Institutions, North Central Association, Room 318, Graduate Education Building, University of Chicago, Chicago, Illinois.

List of Bulletins in the Field of Education, Indiana University

The following is a list of the bulletins published by the School of Education, Indiana University.

All bulletins which are available at the present time may be secured for fifty cents ($.50) per copy, with the exception of the *Second Revision of the Bibliography of Educational Measurements;* the *Bibliography of School Buildings, Grounds and Equipment, Part I; The Philosophy of Human Relations—Individual and Collective;* the *Bibliography of School Surveys and of References on School Surveys;* and the *Bibliography of College and University Buildings, Grounds and Equipment,* which may be secured for seventy-five cents ($.75) per copy. *The Philosophy of Human Relations—Individual and Collective* and all fifty-cent bulletins of the School of Education may be obtained from the University Bookstore. The other four bulletins should be ordered through the Bureau of Coöperative Research, Indiana University.

Proceedings of the High School Principals' Conference (November 23 and 24, 1923). Vol. I, No. 1, 1924. 85 p. (Supply exhausted.)

Investigation of Nursing as a Professional Opportunity for Girls. Part I, Technical Study; Part II, Vocational Information Bulletin. By Florence E. Blazier. Vol. I, No. 2, 1924. 69 p.

Proceedings of the Eleventh Conference on Educational Measurements. Vol. I, No. 3, 1925. 141 p.

Proceedings of the High School Principals' Conference (November 14 and 15, 1924). Vol. I, No. 4, 1925. 49 p. (Supply exhausted.)

First Revision of the Bibliography of Educational Measurements. Compiled by the Bureau of Coöperative Research. Vol. I, No. 5, 1925. 147 p. (Supply exhausted.)

Proceedings of the Twelfth Conference on Educational Measurements. Vol. I, No. 6, 1925. 76 p.

The Effect of Population upon Ability to Support Education. By Harold F. Clark. Vol. II, No. 1, 1925. 28 p.

Proceedings of the High School Principals' Conference (November 20 and 21, 1925). Vol. II, No. 2, 1925. 77 p. (Supply exhausted.)

A Cross-Indexed Bibliography on School Budgets. By Harold F. Clark. Vol. II, No. 3, 1926. 66 p.

A Comparison of the Results Made on Certain Standardized Tests by Pupils in the Bloomington High School Who Were Taught in Classes of the Same Grade by University Student Teachers and by Regular High School Teachers. By Carl G. F. Franzén. Vol. II, No. 4, 1926. 19 p.

Proceedings of the Thirteenth Annual Conference on Educational Measurements. Vol. II, No. 5, 1926. 103 p.

When to Issue School Bonds. By Harold Florian Clark and Paul Royalty. Vol. II, No. 6, 1926. 16 p.

Students' Attitude Toward Examinations. By Grover T. Somers. Vol. III, No. 1, 1926. 48 p.

Proceedings of the High School Principals' Conference (November 12 and 13, 1926). Vol. III, No. 2, 1926. 27 p.

Index Numbers in School Administration. By Harold F. Clark. Vol. III, No. 3, 1927. 35 p.

Topical Analysis of 234 School Surveys. Compiled by the Bureau of Coöperative Research. Vol. III, No. 4, 1927. 111 p. (Supply exhausted.)

Proceedings of the Fourth Annual Conference on Elementary Supervision. Vol. III, No. 5, 1927. 64 p.

Proceedings of the Fourteenth Annual Conference on Educational Measurements. Vol. III, No. 6, 1927. 66 p.

Some Phases of the Junior College Movement. By I. Owen Foster, Harold F. Clark, Willard W. Patty, and Leo M. Chamberlain. Vol. IV, No. 1, 1927. 125 p. (Supply exhausted.)

Second Revision of the Bibliography of Educational Measurements. By Henry Lester Smith and Wendell William Wright. Vol. IV, No. 2, 1927. 251 p.

Bibliography of School Buildings, Grounds, and Equipment, Part I. By Henry Lester Smith and Leo Martin Chamberlain. Vol. IV, No. 3, 1928. 326 p.

Proceedings of the High School Principals' Conference (November 18 and 19, 1927). Vol. IV, No. 4, 1928. 54 p.

The Economic Effects of Education. By Harold F. Clark. Vol. IV, No. 5, 1928. 39 p.

Proceedings of the Fifteenth Annual Conference on Educational Measurements. Vol. IV, No. 6, 1928. 73 p.

Proceedings of the Fifth Annual Conference on Elementary Supervision. Vol. V, No. 1, 1928. 54 p.

Proceedings of the High School Principals' Conference (November 16 and 17, 1928). Vol. V, No. 2, 1928. 33 p.

The Development and Use of a Composite Achievement Test. By Wendell William Wright. Vol. V, No. 3, 1929. 90 p.

An Analysis of the Attitudes of American Educators and Others Toward a Program of Education for World Friendship and Understanding. By Henry Lester Smith and Leo Martin Chamberlain. Vol. V, No. 4, 1929. 109 p.

Tentative Program for Teaching World Friendship and Understanding in Teacher Training Institutions and in Public Schools for Children Who Range from Six to Fourteen Years of Age. By Henry Lester Smith and Sherman Gideon Crayton. Vol. V, No. 5, 1929. 54 p.

Proceedings of the Sixteenth Annual Conference on Educational Measurements. Vol. V, No. 6, 1929. 96 p.

Proceedings of the Sixth Annual Conference on Elementary Supervision. Vol. VI, No. 1, 1929. 73 p.

An Analysis of the Duties of County School Superintendents and Superintendents of Schools in Certain Cities in Indiana. By Henry Lester Smith and Leo Martin Chamberlain. Vol. VI, No. 2, 1929. 94 p.

Proceedings of the High School Principals' Conference (November 22 and 23, 1929). Vol. VI, No. 3, 1930. 51 p.

Coöperative Studies in Secondary Education. By Henry Lester Smith and Carl G. F. Franzén. Vol. VI, No. 4, 1930. 121 p.

Proceedings of the Seventeenth Annual Conference on Educational Measurements. Vol. VI, No. 5, 1930. 103 p.

Proceedings of the Seventh Annual Conference on Elementary Supervision. Vol. VI, No. 6, 1930. 102 p.

A Study in Teacher Supply and Demand in Indiana. By I. Owen Foster, Robert K. Devricks, Harry N. Fitch, Earl C. Bowman, and George L. Roberts. Vol. VII, No. 1, 1930. 77 p.

Proceedings of the High School Principals' Conference (November 7 and 8, 1930). Vol. VII, No. 2, 1930. 70 p.

The Philosophy of Human Relations: Individual and Collective—A Source Book. By Henry Lester Smith and Harold Littell. Vol. VII, No. 3, 1931. 326 p.

The Psychology of Human Relationships: Individual and Social—A Source Book. By Henry Lester Smith and Levi McKinley Krueger. Vol. VII, No. 4, 1931. 107 p.

Proceedings of the Eighteenth Annual Conference on Educational Measurements. Vol. VII, No. 5, 1931. 83 p.

Efficiency in College Management. By John Dale Russell. Vol. VII, No. 6, 1931. 143 p.

Bibliography of School Surveys and of References on School Surveys. By Henry Lester Smith and Edgar Alvin O'Dell. Vol. VIII, Nos. 1 and 2, 1931. 212 p.

Proceedings of the Nineteenth Annual Conference on Educational Measurements. Vol. IX, No. 1, 1932. 139 p.

Bibliography of School Buildings, Grounds, and Equipment—Part II. By Henry Lester Smith and Forest Ruby Noffsinger. Vol. IX, No. 2, 1933. 182 p.

Bibliography of School Buildings, Grounds, and Equipment—Part III. By Henry Lester Smith and Forest Ruby Noffsinger. Vol. IX, No. 3, 1933. 130 p.

A Brief Summary of Literature on Leadership. By Henry Lester Smith and Levi McKinley Krueger. Vol. IX, No. 4, 1933. 80 p.

Proceedings of the Twentieth Annual Conference on Educational Measurements. Vol. X, No. 1, 1933. 98 p.

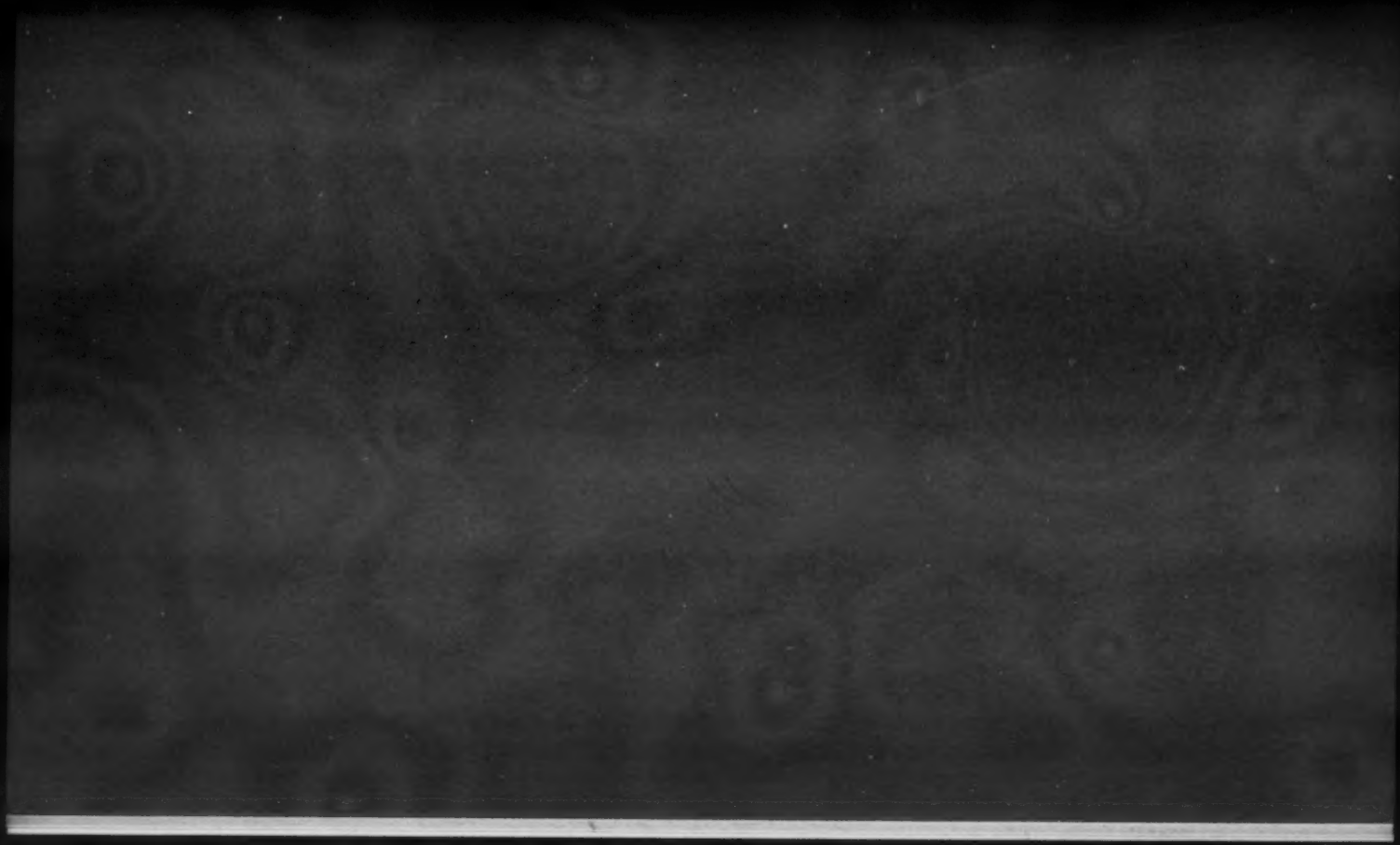
Bibliography of College and University Buildings, Grounds, and Equipment. By Henry Lester Smith and Forest Ruby Noffsinger. Vol. X, No. 2, 1934. 199 p.

Factors Affecting the Organization of School Attendance Units. By Raleigh Warren Holmstedt. Vol. X, No. 3, 1934. 32 p.

The Old World Historical Background of Religious and Moral Education in Schools. By Henry Lester Smith, Robert Stewart McElhinney, and George Renwick Steele. Vol. X, No. 4, 1934. 144 p.

Proceedings of the Twenty-first Annual Conference on Educational Measurements. Vol. XI, No. 1, 1934. 96 p.

Bibliography of School Buildings, Grounds, and Equipment—Part IV. By Henry Lester Smith and Forest Ruby Noffsinger. Vol. XI, No. 2, 1935. 216 p.

A Brief Survey of Present-Day Religious and Moral Education in the Schools of Countries Other Than the United States of America. By Henry Lester Smith, Robert Stewart McElhinney, and George Renwick Steele. Vol. XI, No. 3, 1935. 185 p.

Some Practical Efforts to Teach Good Will. By Henry Lester Smith and Peyton Henry Canary. Vol. XI, No. 4, 1935. 169 p.